ViewCast®

# Niagara® 4100 User Guide

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# Contents

***Before You Begin*** ..... ***1***
Product description ..... 1
Audience ..... 1
Conventions for this guide ..... 2
Rack mount safety instructions ..... 3
FCC notice ..... 4
Environmental notices ..... 5
Installing additional software ..... 6
Connecting to the Internet ..... 6
Warnings ..... 7

***Overview*** ..... ***9***
Media system functions ..... 9
Install overview ..... 10
Prerequisites ..... 10
Package contents ..... 10
System requirements ..... 11
Specifications ..... 11
Niagara 4100 front panel diagram ..... 12
Niagara 4100 back panel diagram ..... 13
Connecting the Niagara 4100 ..... 14
Niagara 4100 system menu ..... 15
Niagara 4100 home page ..... 16
Menu bar commands ..... 16
Niagara 4100 browser windows flow ..... 18

***Easy Setup*** ..... ***19***
Web interface ..... 20
Easy first time set up ..... 21
Connecting to an electrical power source ..... 21
Performing the initial startup ..... 22
Connecting to an IP network ..... 23
Changing the network settings ..... 23

***Basic Operations*** ..... ***27***
Starting up ..... 27
Shutting down ..... 28
Starting an encoder ..... 29
Checking CPU usage ..... 31
Stopping an encoder ..... 32
Connecting an external storage device ..... 33
Exporting captured video files ..... 33

***Web Interface*** ..... ***35***
Logging in ..... 35
Registering your product ..... 37
Viewing all encoders ..... 40
Creating an encoder ..... 41
Starting an encoder ..... 42
Stopping an encoder ..... 44

***Advanced Operations*** ..... ***47***
Editing an Adaptive Apple HTTP encoder ..... 47
Video tab ..... 49
Adaptive encoder video stream table ..... 51
Audio tab ..... 53
Output tab ..... 54
Editing an Adaptive Adobe Flash encoder ..... 56
Video tab ..... 57
Adaptive encoder video stream table ..... 60
Audio tab ..... 62
Output tab ..... 63
Editing an Adaptive Smooth Streaming encoder ..... 65
Video tab ..... 66
Adaptive encoder video stream table ..... 68
Audio tab ..... 70
Output tab ..... 71
Editing an Adobe Flash H.264 encoder ..... 73
Video tab ..... 74
Audio tab ..... 76
Output tab ..... 77
H.264 Presets tab ..... 79
Editing an MPEG-4 encoder ..... 80
Video tab ..... 81

Audio tab ..... 85
Output tab ..... 86
H.264 Presets tab ..... 88
MPEG4 Presets tab ..... 89
MPEG2 Presets tab ..... 90
Editing a Windows Media encoder ..... 91
Video tab ..... 92
Audio tab ..... 94
Output tab ..... 95
DRM tab ..... 98

***TS Container ..... 99***
Streaming to a TS container ..... 99
Streaming ..... 102
Output tab ..... 102

***Encoder Groups ..... 105***
Viewing encoder groups ..... 105
Creating encoder groups ..... 106
Starting an encoder group ..... 107
Stopping an encoder group ..... 107
Editing encoder groups ..... 108

***Additional Settings and Features ..... 109***
Configuring the Preset ABC buttons ..... 109
Using Preset ABC buttons to start an encoder group ..... 111
Viewing all encoders ..... 112
Editing preset encoders ..... 112
Configuring machine properties ..... 113
Changing the computer name ..... 114
Changing the login password from the factory default ..... 115
Restoring the login password to the factory default ..... 115
Configuring alerts ..... 116
Configuring network properties ..... 117
Configuring network cards ..... 117
Configuring the IP address ..... 118
Configuring advanced network settings ..... 118
IP Route table ..... 120
System configuration settings ..... 121
Setting current system configuration ..... 122
Configuring email/SMTP settings ..... 123

Configuring idle screen information ..... 124
Configuring default directory setting ..... 125
Setting CPU thresholds ..... 126
Restoring Niagara 4100 factory defaults ..... 126
Viewing the activity log ..... 128
Viewing alerts ..... 129
Connecting an external storage device ..... 130
Using the Niagara SCX web interface ..... 130

***SNMP ..... 131***
External SNMP Manager ..... 132
SNMP UDP Ports Used by SNMP Manager and SNMP Agents ..... 132
UDP Port for SNMP Requests ..... 132
UDP Port for SNMP Traps ..... 132
Configure ViewCast SNMP Agent Service ..... 133
Configuring community names ..... 133
Configuring permitted SNMP managers ..... 134
Configuring trap destinations ..... 136
Configuring SNMP agent contact and location (optional) ..... 138
Use UDP Port Other Than 161 for SNMP Requests ..... 139
ViewCast SNMP Agent MIB Files ..... 140
Retrieving IP and MAC Addresses of the Encoder System ..... 140
SNMP Examples ..... 140
Query system information (SNMP GET Example) ..... 140
Start/stop an encoder through SNMP ..... 141
Start/stop all encoders per group through SNMP ..... 141
Start/stop all encoders in the system through SNMP ..... 142
Start SNMP trap listener ..... 142

***Appendix A: DRM for Windows Media ..... 143***
Importing a DRM profile ..... 144

***Appendix B: H.264 Advanced Settings ..... 149***
H.264 Presets ..... 149
Settings ..... 150
MPEG-4 Presets ..... 152
Settings ..... 153
MPEG-2 Presets ..... 155
Settings ..... 156

***Appendix C: Mapped Network Drive Setup ..... 159***

***Appendix D: System menu ..... 169***
Encoder menu ..... 170
Encoder start ..... 170
Encoder stop ..... 170
Encoder status ..... 170
Access Health menu ..... 171
CPU status ..... 171
Memory available ..... 171
Setup system menu ..... 172
Network link status ..... 172
Network MAC address ..... 172
View network settings ..... 173
Enable DHCP ..... 173
Set static IP addresses ..... 174
Set gateway address ..... 175
Set date and time ..... 176
Set video standard ..... 176
Factory restore ..... 177
Export files menu ..... 178
Export to USB drive ..... 178
Shutdown Niagara 4100 ..... 178

***Index ..... 179***

# *Before You Begin*

Thank you for purchasing the ViewCast Niagara 4100 streaming media system. This user guide provides step-by-step instructions for installing and using your new streaming media system. For the latest ViewCast product information and news, visit our website at www.viewcast.com.

## Product description

The Niagara 4100 is designed with a combination of simplicity, portability and power to quickly and easily stream your high-definition (HD) content to broadband and mobile networks including Microsoft® Live IIS Smooth Streaming, live Adaptive streaming to Adobe® Flash Media Server and Apple® (iPhones® and iPads®), Adobe Flash® H.264, MPEG-4, H.263, H.264, and Microsoft Windows Media® (Silverlight® compatible) SD and HD, as well as container support for 3GPP and 3GPP2. With the ability to ingest HD video, the Niagara 4100 is ideal for live sports, live newsgathering, webcasting or any streaming application where you need rock-solid HD performance on the go.

This rugged, portable streaming system can ingest standard- or high-definition video sources through its SDI input, and accommodates a variety of audio input formats, including embedded SDI, AES/EBU, and balanced or unbalanced stereo.

**Figure 1. ViewCast Niagara 4100**

## Audience

The audience for this publication includes anyone who uses or administers the Niagara 4100. They should have a basic technical understanding of streaming media. This user guide provides information on the Niagara 4100 only.

# Conventions for this guide

This guide uses the document conventions specified below to help you identify different types of information.

| Convention | Description | Example |
|---|---|---|
| **Bold text** | Characters to enter when referenced in a procedure. The name of fields or keys to press. | Enter **DTMF** as the group type. Press **Enter** to save all your changes. |
| *Note:* | Provides supplemental information. | *Note: The prompt may not display if …* |
| *IMPORTANT!* | Provides important data that affects how the system or software responds. | *IMPORTANT! You must install Niagara SCX prior to configuring SCX options…* |
| *CAUTION!* | Provides information to help avoid possible damage to hardware or a system crash (without data loss). | *CAUTION! Use case sensitive commands to keep from destroying…* |
| *WARNING!* | Provides information to ensure you avoid potential injury, death, or permanent system damage. | *WARNING! Do not touch exposed wires.* |

# Rack mount safety instructions

| | |
|---|---|
| **Operating Temperature** | The operating ambient temperature of a rack environment may be greater than room ambient if installed in a closed or multi-unit rack assembly. Therefore, you should install the equipment in an environment compatible with the maximum ambient temperature of 40° C. |
| **Reduced Air Flow** | You must not compromise the airflow required for safe equipment operation when you install the equipment in a rack. |
| **Mechanical Loading** | Mounting of the equipment in the rack should be such that you do not cause a hazard due to uneven mechanical loading. |
| **Circuit Overloading** | Consider the connection of the equipment to the supply circuit and the effect that the overloading of the circuits might have on current protection and supply wiring. You must also consider and use the equipment nameplate ratings when you address this concern. |
| **Reliable Grounding** | You must maintain reliable earth grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as using power strips). |

# FCC notice

*WARNING! You must connect this device and peripherals using shielded cables to comply with FCC radio emission limits.*

*WARNING! Modifications to this device not approved by ViewCast Corporation could void the FCC-granted authority for you to operate the device.*

*WARNING! The Niagara 4100 complies with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits provide reasonable protection against harmful interference when you operate the equipment in a commercial environment. This equipment generates, uses, and may radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area will likely cause harmful interference. In this case you must correct the interference at your own expense.*

*To CATV Installer: Pay special attention to Section 820-40 of the NEC that provides guidelines for proper grounding. It particularly specifies that you must connect the cable ground to the grounding system of the building as close to the point of cable entry as practical.*

*WARNING! Equipment installation must comply with local and national electrical codes.*

# Environmental notices

**Product Disposal Information:**

Dispose of this product in accordance with local and national disposal regulations (if any) including those regulations governing the recovery and recycling of Waste Electrical and Electronic Equipment (WEEE).

**RoHS Compliant:**

ViewCast Corporation commits to compliance with the European directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, Directive 2002/95/EC, the RoHS directive.

This product supplied to the European Union does comply with the RoHS directive. ViewCast certifies that this equipment shipped to the European Union conforms to the 2002/95/EC directive.

For current RoHS statement, see www.viewcast.com**.**

**Underwriters Laboratories Inc. Statement**

Underwriters Laboratories Inc. has not tested the performance or reliability of the security or signaling aspects of this product. UL only tested for fire, shock, and casualty hazards as outlined in UL's Standard for Safety UL 60950-1. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.

UL does not represent, warranty, or certify the performance of reliability of any security or signaling related functions of this product.

# Installing additional software

The Niagara systems run an embedded version of the Microsoft Windows 7 operating system (OS), which is a sub-set of the normal retail version. The Microsoft License agreement limits the use of the system to what the machine is designed to do.

The Microsoft Update process is turned off by default to prevent interruptions during live streaming events. It is also not advised to use a Windows 7 installation CD to add features to the system or the appliance may fail.

You may load additional software on the appliance; however, ViewCast does not support this additional software. You also need to ensure the primary drive is not full or the appliance will fail. In the event of a problem, you may need to perform a Factory Restore, which returns the appliance to the original software load. You may save the current encoder profiles and reload them when the Factory Restore is complete.

You can perform a Factory Restore at any time. This process returns the appliance to the software load that came with the appliance. Perform a Factory Restore if the appliance becomes unstable due to installed applications, viruses, etc. Please refer to the user guide for instructions.

ViewCast Support can provide assistance should the system fail to start. In most cases, you can restore a system to operation without returning it to ViewCast. There is a fee in the event a user returns a system due to applications the user installed or if the appliance failed because the primary partition (drive C) is full.

# Connecting to the Internet

Never connect a Niagara system directly to the Internet. ViewCast recommends taking precautions against unwanted access such as installing Niagara systems behind a router or firewall. The speed of the router or switch should match or exceed the speed of the system's network card. See your network administrator for recommendations.

# Warnings

Only trained and qualified personnel should install, replace, or service this equipment.

Do not attempt to open the case of the system. If you do, you incur a high risk of electrical shock that may cause damage to the system or personal physical injury or death to you and/or others. No user-serviceable parts exist inside the system. If you open the system case or make unauthorized changes to the case, you void the warranty.

Install the system away from any heat sources. This remains vital to the safety of the product users. Do not install the system near any heat sources such as:

- Radiators
- Heat registers
- Stoves
- Other heat-producing equipment

*WARNING! Installing the system near heat sources could result in personal injury or death.*

*Never insert objects of any kind into the system through any system openings, as the objects may touch dangerous voltage points, short out parts, and result in a risk of fire or electrical shock.*

Do not stack the system atop or below other electronic devices as this can cause heat build-up and vibration of the system. These conditions can damage the system thereby voiding the limited warranty.

You may stack multiple Niagara 4100 units as these systems accommodate stacking.

Do not install the system in any area where the temperature is less than 5°C or more than 40°C. Transfer from temperature extremes may cause condensation. Let the system remain unplugged at room temperature for at least 45 minutes before connecting it.

Use an outlet with surge suppression or ground fault protection when using the system. Unplug the power cord from the wall outlet, disconnect the network connection, and disconnect the lines between the system and the video source for added protection:

- During a lightning storm
- During dangerous weather conditions
- When the encoder remains unattended or unused for long periods

Reduce the risk of fire or electric shock. Do *not* expose the system to any rain or moisture. Exposing the system to rain or other types of moisture could result in system damages. Do not place any liquids on or near the system. If you place liquids in any form on or near the system, do so at your own risk, for you incur a high risk of electrical shock that could occur and cause damage to the system.

*WARNING! Exposing the system to rain or other types of moisture could result in physical injury or death. Any liquids on or near the system may result in electrical shock and personal injury or death.*

Refer all servicing to authorized service personnel. You must have authorized personnel only service any damaged system. Relevant damage may occur with but is not limited to the following:

- An unplugged or damaged power supply cord
- Spilled liquid on the system
- Fallen objects in or on the system
- Appliance exposure to rain or other moisture or liquid
- Failure to perform as described in the User Guide
- A dropped system

ViewCast assumes no liability or responsibility for any damaged system that clients continue using.

Use only attachments, accessories, or equipment specified by the manufacturer with the system. Using accessories or attachments not recommended by the encoder manufacturer voids the Limited Warranty.

*WARNING! When using 4-pin XLR to cigarette car plug cables, do not disconnect the car battery adaptor or turn off the car engine before you turn off the player. Doing so may damage the player.*

Do not attempt to service the system yourself. If you open or remove covers, you may be exposed to dangerous voltage. Such action voids the Limited Warranty. Refer all servicing issues to authorized service personnel only.

The plug-socket combination that serves as the main disconnecting device must be accessible at all times.

Protect the power cord from anyone walking on it and being strained or pinched particularly at plugs, electrical receptacles, and the point where the power cord exits the system.

Do not use adapter plugs or remove the grounding prong from the power cable.

Use only the type of power source indicated on the marking label on the back panel of the unit to operate the system. Unplug the system power cord by gripping the plug and removing it from the power source. Do not pull the cord to remove the power source from the system.

Do not plug the system into a wall outlet that contains an overload of electrical cords or power strips/extension cords. This type of overload may result in fire or electrical shock risks.

Always handle the system carefully. Always avoid excessive shock and vibration to the system. Excessive shock or vibration can damage the system.

*WARNING! Excessive shock or vibration to the system may result in electrical shock and personal injury or death.*

# *Overview*

Before you can use your Niagara 4100 streaming media system, you first need to set up and configure it. This chapter is dedicated to providing you with the details and step-by-step instructions you need to make your installation as quick and easy as possible.

All you need to get started are the four following requirements:

- AC power source (100 - 240 V)
- Your audio and video source (such as a camera, video player, or other A/V output device)
- A streaming media server or hosting provider
- IP connection and/or Internet connection

The Niagara 4100, an easy-to-use streaming device, allows you to:

- Connect to a compatible browser on a dynamic host configuration protocol/domain name server (DHCP/DNS) network.
- Configure and connect your audio and video source to the Niagara 4100.
- Select your output formats and streaming settings.
- Enter your streaming server information.
- Start streaming your media.

You can configure and use the Niagara 4100 straight from the box for any streaming activities. Use the web interface for setting options and controlling your Niagara 4100 from another networked computer, as well as more advanced options.

*WARNING! Read the installation instructions before connecting the system to the power source*.

## Media system functions

Although it has many features and capabilities, the Niagara 4100 streaming media system performs, in its most basic functions, as follows:

- Takes analog audio and SDI video inputs
- Captures the signals
- Encodes the signals into digital IP video formats
- Delivers the IP audio and video content to a storage device or streams it over an IP network

# Install overview

This section addresses the high-level actions you must perform to physically connect and set up your Niagara 4100 system.

You must complete the following primary tasks to install the Niagara 4100:

- Address and comply with all prerequisites.
- Connect the Niagara 4100 streaming media system using its power source.
- Connect the video source (camera or video recorder) to the system.
- Connect the Niagara 4100 to an IP network.
- Configure the Niagara 4100 system.

# Prerequisites

Before installing and connecting the Niagara 4100, ensure you comply with the following prerequisites:

- All packaged items are undamaged and in working order.
- Your environment meets all system requirements.
- Safety instructions, notices, and warnings detailed in *Before You Begin* including:
  - *Rack Mount Safety Instructions*
  - *FCC Notice*
  - *Environmental Notices*
  - *Warnings*

# Package contents

Completely unpack all contents from the box and inspect each item for damage. Ensure that you have all the components listed below:

| | |
|---|---|
| **Appliance** | • Niagara 4100 |
| **Power Cables** | • One of the following:<br>  ○ *North America power cable (110 vac)*<br>  ○ *International power cable (220 vac)*<br>  ○ *UK power cable (220 vac)*<br>• AC to DC converter |
| **Guides** | • Package insert (end-user license agreement, welcome letter, package content list)<br>• User guide (on CD in PDF format)<br>• Quick Start Guide |
| **Software** | • 1 Niagara 4100 CD |
| **Hardware** | • Rugged carrying case |

If any components are missing or damaged, do not continue with the installation. Contact the ViewCast reseller from which you purchased your Niagara 4100 streaming media system for assistance in obtaining any missing parts or for parts replacement.

# System requirements

Ensure your computer meets the following system requirements.

| | |
|---|---|
| **Browser Interface** | Any Internet Explorer (IE)-based computer, workstation, or laptop that interfaces to a dynamic host configuration protocol/domain name server (DHCP/DNS)-compatible network |
| **User Interface** | High-speed Internet, dial-up, and mobile device users |

## Specifications

- Intel i7 processor
- 4 GB RAM or larger
- HDD (160 GB or larger)
- Osprey 710e HD technology
- 4.5” H x 8” W x 12” D)
- 8 lbs (3.6 kg)
- 90 W power supply

# Niagara 4100 front panel diagram

You should familiarize yourself with the front panel controls for the Niagara 4100 (Figure 2). Besides the basic buttons for power, start/stop, up/down and menu access, there are indicator lights that are hidden until illuminated.

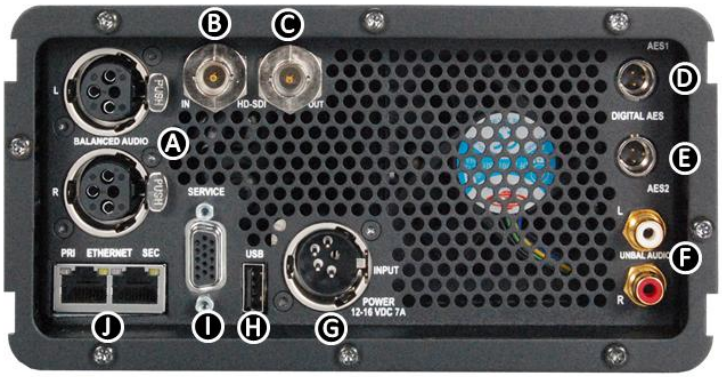
**Figure 2. Niagara 4100 front panel**

| | |
|---|---|
| **A** | Press this button once to power up the system. When the system is powered up, press this button once will power it down. |
| **B** | Allows exporting files to USB devices and installing updates or firmware. |
| **C** | Indicates audio input presence. |
| **D** | Allows headphones to be connected to the system for audio monitoring. |
| **E** | Controls the audio level on the headphones. |
| **F** | Press this button to stop an encoder when it is highlighted on the LCD display. |
| **G** | Press this button to start the encoder highlighted on the LCD display. |
| **H** | These buttons are used for system menu navigation on the LCD display. |
| **I** | Press this button to enter or accept the menu choice highlighted on the LCD display.<br>This button is used for system menu operations. |
| **J** | Press this button to activate the system menu on the LCD display. |
| **K** | When the Alarm Light indicator is lit, press this button to view a log of the most recent alarms recorded.<br>Press **Enter** to clear these alarms from the log. |
| **L** | Displays menus and system messages. |
| **M** | This light indicates when the system detects that a video source is connected to one of its video inputs.<br>*Note: This light only illuminates when you start an encoder.* |
| **N** | Indicates that another user is accessing the system across the network from a computer. |
| **O** | Indicates that an application alert has occurred. |
| **P** | When an encoder profile is assigned to one of these buttons, press the assigned button and then **Stream** to start the encoder.<br>Press the assigned button and then **Stop** to stop the encoder. |

# Niagara 4100 back panel diagram

Refer to Figure 3 for all the connectors and other components of the Niagara 4100 back panel.

**Figure 3. Niagara 4100 back panel**




| | |
|---|---|
| **A** | Left/right XLR connector for balanced audio sources. Professional audio engineers use XLR connectors. The connectors are on high-end audio and video playback equipment.<br>*Note: A microphone preamplifier or mixer with XLR preamp functions is required to connect an XLR microphone to the balanced audio input.* |
| **B** | Receives high-definition SDI video to the unit. This SDI input allows professional-grade video connections. |
| **C** | Transmits high-definition SDI video from the unit. |
| **D** | Digital AES audio 1. |
| **E** | Digital AES audio 2. |
| **F** | Left/right RCA connectors for unbalanced audio sources. |
| **G** | Provides system power. |
| **H** | Connects USB control devices, such as a memory card (USB memory device, keyboard, and mouse). |
| **I** | Use this auxiliary VGA output port to connect an external VGA monitor so you can view the operating system interface. |
| **J** | Dual Ethernet ports provide redundant connections to your network. |

# Connecting the Niagara 4100

Follow the steps below to configure all Niagara 4100 connections. The example uses SDI video and audio. The following steps refer to a direct connection to the Niagara 4100 only.

**To connect the Niagara 4100:**

1. Connect to the SDI digital input for video and audio (item B on Figure 3). Ensure you have a tight connection.
2. Connect the power adaptor (item G on Figure 3).
3. Attach the Niagara 4100 to the network input (item J on Figure 3).
4. Press **Power** (item A on Figure 2).

# Niagara 4100 system menu

The Niagara 4100 system menu (Figure 4) is located on the LCD panel on the front of the unit. The menu allows you to quickly and easily configure the Niagara 4100. You use the **Up** and **Down** arrow buttons to navigate through the different functions on the system menu.

**Figure 4. System menu**

| | |
|---|---|
| **Encode** | • Start an encoding session.<br>• Stop an encoding session.<br>• View the status of an encoding session. |
| **Access Health** | • Check the CPU status.<br>• View available memory.<br>• Check the temperature of the unit.<br>• Check the versions. |
| **Setup System** | • Set the Preset A,B,C buttons.<br>• View network settings.<br>• Configure primary or secondary settings.<br>• View link status.<br>• Set the network MAC address.<br>• Set time and date.<br>• Set the video standard. |
| **Export Files** | • Export files to a USB memory device. |
| **Shutdown System** | • Restart system.<br>• Power off system. |

# Niagara 4100 home page

The home page (Figure 5) is the first page that appears after you log into the Niagara SCX Remote Management Software. From this page, you can access the different windows for configuring, controlling, and monitoring the activities and alerts from the Niagara 4100.

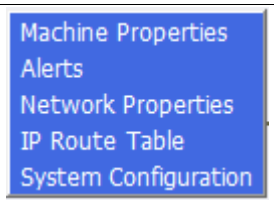
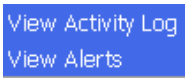
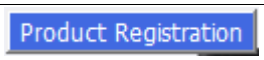
**Figure 5. Niagara 4100 home page**

Niagara® 4100
ViewCast
Home
Encoders
Configuration
Status
Maintenance
Log Out
Welcome admin to Niagara 4100
This Web interface provides remote configuration and control of your Niagara 4100 encoding appliance.
From this Web interface, you can:
• View or modify the Encoder settings and assign them to the front panel Preset ABC buttons
• View and modify the Appliance settings
• Configure System Alerts
• View and modify Network Properties
• Change the System Configuration settings
• Manage Encoder Groups
Please register to activate product.

## Menu bar commands

The home page menu bar allows you to use the menu bar commands.

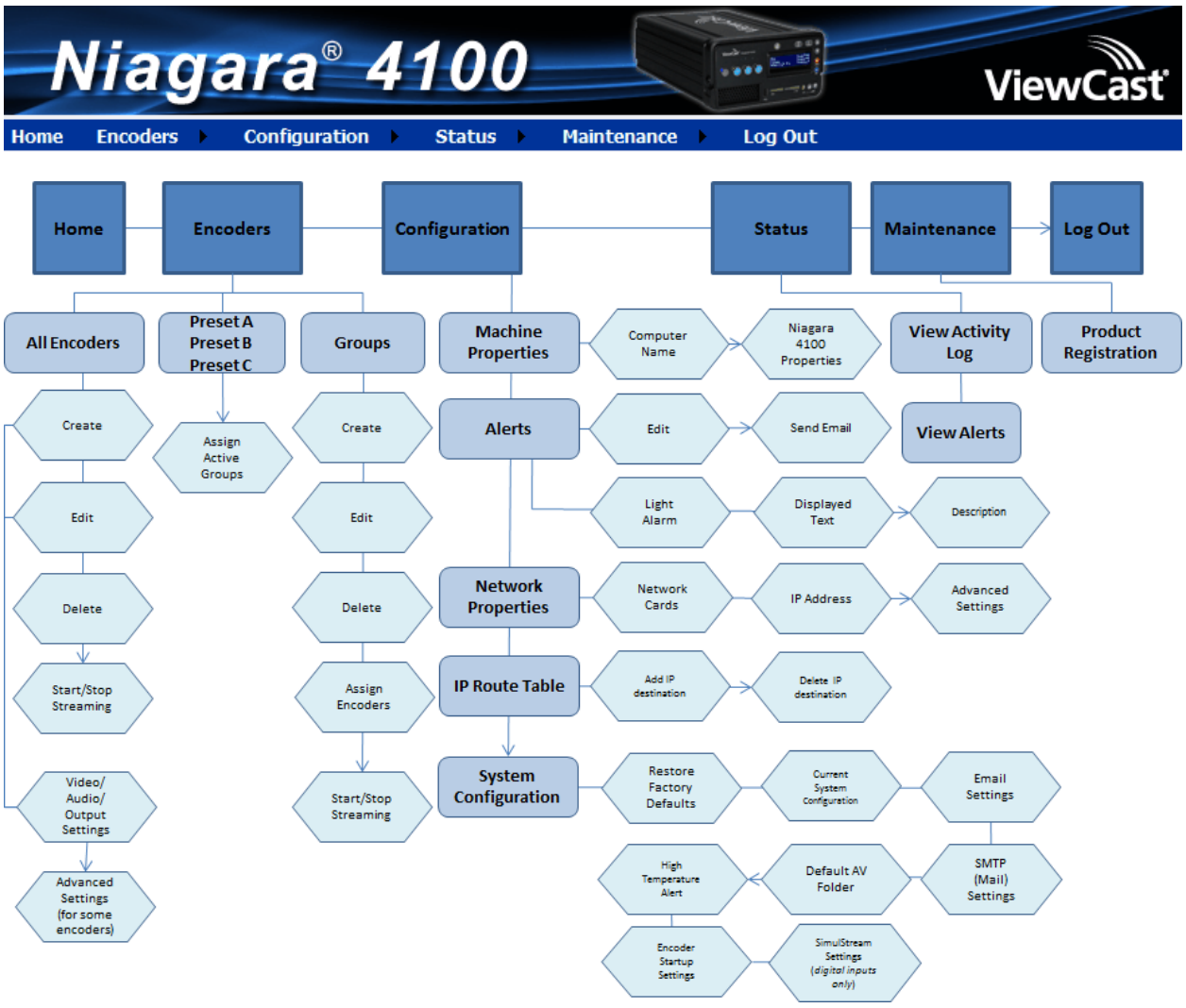
| Menu | Command | Function |
|---|---|---|
| **Home** | | • View general administrative information about the ViewCast Niagara 4100.<br>• Use the menu bar commands. |
| **Encoders** | All Encoders<br>Preset A<br>Preset B<br>Preset C<br>Groups | • **All Encoders** – View the encoder profiles available to start on the encoder box.<br>• **Preset A** – Assign an encoder group to the A button on the front panel of the system.<br>• **Preset B** – Assign an encoder group to the B button on the front panel of the system.<br>• **Preset C** – Assign an encoder group to the C button on the front panel of the system.<br>• **Groups** - Manage specific encoder groups that have one or more encoders assigned. |

| | | |
|---|---|---|
| **Configuration** |  | • **Machine Properties** – View details on the **Machine Properties** of the Niagara 4100 including the Network Name, Serial Number, and all software versions installed.<br>• **Alerts** – Modify the settings for each application alert Niagara 4100 can generate during normal operations.<br>• **Network Properties** – View information on Niagara 4100 network properties and addresses for both NIC ports and modify these properties.<br>• **IP Route Table** – Add or delete IP destinations.<br>• **System Configuration** – Modify the system configuration including setup for email alerts from Niagara 4100 whenever it encounters an operation error. |
| **Status** |  | • **View Activity Log** – View all Niagara 4100 activities including the time and date for each event.<br>• **View Alerts** – View all alerts including the time and date for each alert. |
| **Maintenance** |  | • **Product Registration** – Register your Niagara system to protect your investment. |
| **Log Out** | | • Log out of the Niagara 4100 and return to the website login screen. |

# Niagara 4100 browser windows flow

Figure 6 shows the interrelationship and flow of the available windows you may use to configure the Niagara 4100.

**Figure 6. Niagara 4100 browser window**



# Easy Setup

You use two interfaces to operate your Niagara 4100 streaming media system.

- Niagara 4100 front panel LCD display and buttons
- Web interface through Niagara SCX remote management software

Most of the basic operations can be performed from the front panel of the Niagara 4100 streaming media system.

You should perform most setup and operations by accessing the Niagara SCX web interface from a computer that resides on the same network as your Niagara 4100 system.

With the web interface, you can customize your encoding settings and assign specific encoding profiles to the Preset ABC buttons on the front panel. The web interface provides the ability to control your Niagara 4100 remotely from a computer that can be rooms or continents away from the system provided that both your Niagara 4100 and the computer have Internet access to communicate with each other.

The easy setup option explores the optimal configurations for the novice user to easily and quickly set up the Niagara 4100. Easy setup includes actions you can perform on your Niagara 4100 streaming media system using the web interface to include configuring the following:

- Encoder settings
- Groups
- Network properties
- Machine properties
- System configuration
- System alerts

# Web interface

The web interface presents a logical flow of configuration information for the encoding system. Refer to Figure 6 for a diagram and menu bar commands which include:

- Home
- Encoders
  - *All Encoders including encoder properties*
  - *Presets A, B, and C*
  - *Groups*
- Configuration
  - *Niagara Properties*
  - *Alerts*
  - *Network Properties*
  - *IP Route Table*
  - *System Configuration*
- Status
  - *Activity Log*
  - *Alerts*
- Maintenance
  - *Product Registration*
- Log Out

# Easy first time set up

You should read all instructions, notices, and warnings in the *Before You Begin* section prior to getting started with your new Niagara 4100 hardware for the first time. Also, ensure you have all required parts and meet all system requirements before installing this product.

Do not continue with the installation if you find any components missing or damaged. Contact the ViewCast reseller where you purchased your Niagara 4100 system for assistance in obtaining any missing or replacement parts.

## Connecting to an electrical power source

Niagara 4100 ships with one of the following power cables:

- North America power cable
- International power cable
- UK power cable

**To connect the power source:**

1. Attach the block end to the power input located on the Niagara 4100 AC/DC adapter.
2. Plug the other end of the cable into a wall outlet or surge protection enabled power strip connected to a wall outlet or other common power source.

*WARNING! The plug-socket combination must remain accessible at all times as it serves as the main disconnecting device.*

*Do not work on the system or connect or disconnect cables during periods of lightning activity.*

*WARNING! When using 4-pin XLR to cigarette car plug cables, do not disconnect the car battery adaptor or turn off the car engine before you turn off the system. Doing so may damage the system.*

# Performing the initial startup

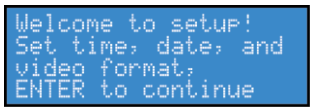
The first time you power up the Niagara 4100, a series of menus appear on the LCD display that will assist you in setting up the system clock, date, and video input format (NTSC (North America/Japan) or PAL).

The steps below refer to a *direct* connection to the Niagara 4100 only.

**To perform the initial startup:**

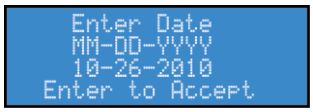
1. Ensure that you connect all devices (power cords, systems, streaming devices, etc.) to the Niagara 4100.
2. Press **Power** on the front panel to start the Niagara 4100. The LCD readout displays the welcome screen (Figure 7).

   **Figure 7. Initializing messages**

3. Press **Enter** . The system prompts you to set the date (Figure 8).

   **Figure 8. Date screen**

4. Use the **Up** and **Down** arrow buttons to change the numerical value of the month.
5. Press **Stop** to move to the field to the left. Press **Stream** to move to the field to the right.
6. Use the **Up** and **Down** arrow buttons to increment the numerical value of the day and year.

   *Note: If you want to change a previous setting, continue pressing **Stream** until the cursor cycles around to the desired field.*

7. Press **Enter** to accept the settings and move to the next screen to set the system clock (Figure 9). Niagara 4100 uses a 24-hour clock format for its system clock entries.

   **Figure 9. Time screen**

8. Use the **Up** and **Down** arrow buttons to change the numerical value of the hour.
9. Press **Stream** to enter the value and move to the Minute field.
10. Use the **Up** and **Down** arrow buttons to change the numerical value of the minute.

11. Press **Enter** to set the format. The screen appears (Figure 10) confirming you have successfully set up your Niagara 4100.

    **Figure 10. Confirmation screen**

12. Press **Enter** to exit the setup menu and reboot the system. The following screen appears:

    **Figure 11. Booting screen**

# Connecting to an IP network

The Niagara 4100 network settings for its network interfaces default to dynamically obtain an IP address from a DHCP server on the network. If a DHCP server is not available or is not found on the network, then Niagara 4100 assigns its own IP address.

If you are not familiar with network protocols, contact your network administrator for assistance.

# Changing the network settings

For most network environments, it will not be necessary to modify these default settings. However, if you wish to assign a static IP address or Gateway address to the system's Network Interface Cards (NICs), then you can change the network setting using the system menu.

**To change the network settings:**

1. Press **Menu**. The system menu appears.
2. Use the **Up** and **Down** arrow buttons to select the **Setup System** option.
3. Press **Enter**. The setup menu displays (Figure 12).

   **Figure 12. Setup menu**

4. Use the **Up** and **Down** arrow buttons to select **Network**.
5. Press **Enter**. The network interface screen appears (Figure 13).

   **Figure 13. Interface screen**

6. Use the **Up** and **Down** arrow buttons to select the network interface you wish to modify.

7. Press **Enter**. The settings screen appears (Figure 14).

**Figure 14. Settings screen**

8. Use the **Up** and **Down** arrow buttons to select **Change Settings**.
9. Press **Enter**. A screen appears that displays the various network settings.
10. Select the network setting you wish to change.

*Note: Once you modify the setting, the system saves the changes until you modify the settings again or until you restore the system back to its original factory settings.*

11. Press **Enter**. The network settings screen displays (Figure 15).

**Figure 15. Network settings screen**

12. Use the **Up** and **Down** arrow buttons to select **DHCP On/Off**.
13. Press **Enter**. The enable DHCP screen appears (Figure 16).

**Figure 16. Enable DHCP screen**

*Note: Press **Menu** to cancel this action and exit.*

14. Use the **Up** and **Down** arrow buttons to select **Yes**.
15. Press **Enter**. The screen with the network settings appears.
16. Use the **Up** and **Down** arrow buttons to enter a static address for the IP and/or Gateway address.
17. Press **Enter**. The network setting screen appears.
18. Use the **Up** and **Down** arrow buttons to change the numeric value incrementally and enter either the static IP or Gateway address.
19. Press **Stream** to move to the next field.
20. Press **Enter**. The subnet address screen appears (Figure 17).

**Figure 17. Subnet address screen**

21. Use the **Up** and **Down** arrow buttons to change the numeric value incrementally and enter the

subnet address.

22. Press **Enter**.

*Note: To remove a static IP and/or Gateway address, follow steps 11 through 15 to enable DHCP. The system removes any previously entered static address.*

# Basic Operations

You may customize your encoder settings and assign specific encoder profiles using the front panel.

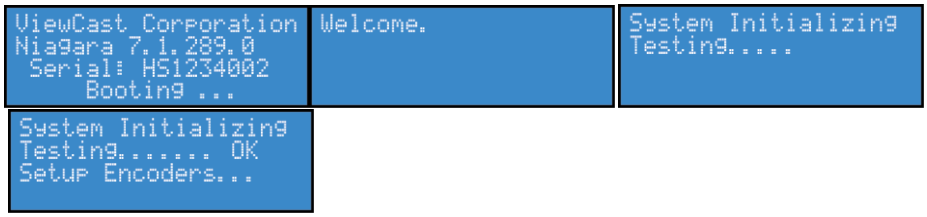
## Starting up

If this is the first time you are using the Niagara 4100, refer to the *Performing the initial startup* section before continuing.

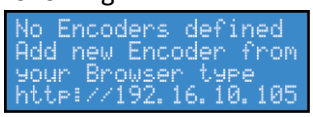
**To start up:**

1. Press **Power** . The LCD readout displays the initializing messages (Figure 18).

   **Figure 18. Initializing messages**

   When the system is ready, the LCD display alternates between status readouts similar to the following:

2. Load encoders (see *Creating an encoder*).

# Shutting down

Allow the Niagara 4100 to power down normally. If you force the system to shut down improperly, your data can be corrupted. If so, the next time you start the system it can take several minutes to complete startup.

**To shut down:**

1. Press **Menu**. Tab down to Shutdown System (Figure 19).

   **Figure 19. System menu**

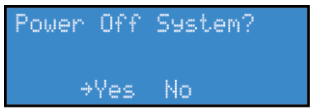
2. Press **Enter**. The shutdown screen appears (Figure 20).

   **Figure 20. Shutdown screen**

3. Tab to **Power Off System**. Press **Enter**. The Power Off System? screen appears.

   **Figure 21. Power off screen**

4. Tab to **Yes** and press **Enter**. The shutdown screens appear.

   **Figure 22. Shutdown screens**

   The system shuts down.

You can also shut down the system using the following steps:

1. Briefly press **Power**. The system stopping messages appear (Figure 23).

   **Figure 23. System stopping messages**

   *Note: The serial number will reflect the current version on your system.*

   After a few seconds, the system powers off.

# Starting an encoder

Niagara 4100 is a single-channel encoder, which means you can only connect and stream one audio and video source at any given time. However, you can stream the same audio and video at multiple data rates and multiple formats to provide the best user experience for different viewing audiences.

For example, you can stream Windows Media at full resolution at 1500 kbps and at the same time stream Adobe Flash at CIF resolution at 500 kbps.

From a network computer connected to the same network, log in to the web interface and create encoders (see *Creating an encoder*). The LCD screen on the Niagara 4100 displays the list of available encoder profiles you created and the status of each.

**To start an encoder:**

1. Press **Stream** on the front panel of your Niagara 4100. A list of available encoder profiles you can use and the current status of each appears (Figure 24).

   **Figure 24. Encoder screen**

   *Note: The system abbreviates the name of each encoder profile to the first 10 characters. When creating names for custom profiles, be sure to create unique names that will be distinguishable by the first 10 characters.*

2. Use the **Up** and **Down** arrow buttons to select the encoder profile you want Niagara 4100 to use for this encoding session.
3. Press **Stream** to start the encoder. The starting screen appears (Figure 25).

   **Figure 25. Starting screen**

   The encoder screen appears indicating that the encoder you selected has begun streaming (Figure 26).

   **Figure 26. Encoder screen**

   *Note: If the encoder you started is assigned to one of the Preset ABC buttons, the corresponding button illuminates during and after the starting process.*

4. Repeat this method to start streaming multiple encoders at the same time.

   *WARNING! There is a limit to how many encoders the Niagara 4100 can stream at one time. If you exceed this limit, the streams will drop frames and the video will appear to stutter resulting in a poor viewer experience. If you do not reduce the number of streams to lessen the CPU load, all encoders could self-terminate without warning. Refer to the* Checking

CPU usage *section to understand the limitations*.

After the encoder session has successfully begun, the LCD display returns to the previous display of available encoders. The screen will indicate that the encoder profile you selected has begun encoding.

The video detection light illuminates when the system detects that a video source is connected to its video input.

# Checking CPU usage

When the Niagara 4100 is idle (no encoders are streaming), the CPU percentage is normally 4 % or less. If one or more encoders are streaming, the percentage is much higher and fluctuates in a range of +/- 10 %. If the system is using less than 80 %, you may start another encoder without adversely affecting system performance (depending on the complexity of the profile).

**To check CPU usage:**

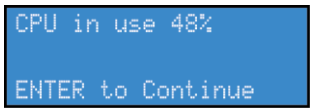
1. Press **Menu**. The system menu appears.
2. Use the **Up** and **Down** arrow buttons to select **Access Health**.
3. Press **Enter**. The access menu appears (Figure 27).

   **Figure 27. Access menu**

4. Use the **Up** and **Down** arrow buttons to select CPU.
5. Press **Enter**. A screen appears (Figure 28) with the amount of CPU cycles currently in use.

   **Figure 28. CPU cycles screen**

6. Press **Enter**.

# Stopping an encoder

**To stop an encoder:**

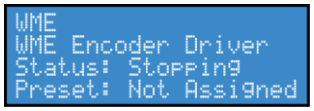
1. Press **Menu**. The system menu appears.
2. Press **Enter**. The encoder screen appears.
3. Use the **Up** and **Down** arrow buttons to highlight the encoder you wish to stop.
4. Press **Stop**. The encoder screen appears (Figure 29) showing the status of each encoder.

   **Figure 29. Encoder screen**

5. Use the **Up** and **Down** arrow buttons to select the encoder you want to terminate.
6. Press **Stop**. The stopping screen appears (Figure 30).

   **Figure 30. Stopping screen**

7. Press **Menu**. The system menu appears.

# Connecting an external storage device

The Niagara 4100 has one USB port on the front panel and one on the back panel. You can connect almost any standard USB memory device to one or both of these ports. You can then export any audiovisual files you may have created on Niagara 4100's local storage drive. The local storage drive is drive D when you use the **Save to File setting** from the web interface.

When you insert a USB storage device in one of the USB ports on the Niagara 4100, the system automatically detects the removable storage device, and assigns a drive letter to the device. This device can capture files directly using the Niagara 4100 Export Files function on the front panel menu.

# Exporting captured video files

You can export your captured video files to an external USB drive. But first you must set a default location through the web interface. Refer to *Configuring default directory setting* before completing the steps below.

**To export captured video files:**

1. Insert a USB memory device into a USB port
2. Press **Menu**. The system menu appears.
3. Use the **Up** and **Down** arrow buttons and highlight the **Export Files** option (Figure 31).

   **Figure 31. System menu**

4. Press **Enter**. The USB device screen appears (Figure 32).

   **Figure 32. USB Device screen**

5. Press **Enter**. The drive destination screens appear (Figure 33).

   **Figure 33. Drive Destination screens**

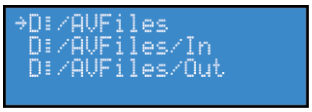
6. Use the **Up** and **Down** arrows to select the USB drive.

7. Press **Enter**. The searching folder screen appears (Figure 34).

**Figure 34. Select Folder screen**

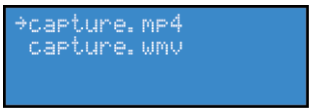
The select source screen appears (Figure 35).

**Figure 35. Select source screen**




8. Use the **Up** and **Down** arrows to select the desired directory.
9. Press **Enter**. The filename screen appears (Figure 36).

**Figure 36. Filename screen**




10. Use the **Up** and **Down** arrows to select the desired file to transfer.
11. Press **Enter**. While the Niagara 4100 exports the file, the exporting screens appear (Figure 37).

**Figure 37. Exporting screens**

# Web Interface

The Niagara 4100 includes a web interface, which allows you to access the advanced system settings. The web interface also provides detailed settings and control over the encoder profiles installed on Niagara 4100.

The web interface does not require software and works with any computer that has a current web browser, including Windows®, Macintosh®, and Linux® machines. For the best user experience, ViewCast recommends Internet Explorer (you may need to use the compatibility mode). The Niagara 4100 must either reside on a shared IP network with the computer or can be directly connected to a Windows computer using an Ethernet cable (RJ45).

## Logging in

**To log in:**

1. You can either locate the serial number:
   - On the underside of the system (in the format hsxxxxxx).

   Or
   - On the LCD display when the system is idle (Figure 38).

   **Figure 38. System Ready screen**

   *Note: If the system ready screen does not immediately display, use the Up and Down arrow buttons to toggle through the system information until the system ready screen appears.*
2. Open the web browser on your computer.
3. You can either:
   - Type the Niagara 4100 serial number in the Address bar (Figure 39).

   **Figure 39. Serial number**

   Or
   - Type the IP address in the Address bar (Figure 40).

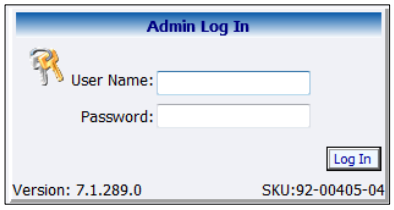
   **Figure 40. IP address**

*Note: The IP address appears on the system ready screen when the system is idle.*

The Admin Log In window appears (Figure 41).

**Figure 41. Admin Log In window**




*Note: The version and SKU fields display the current numbers on your system.*

4. Type the **User Name** and **Password**.

   *IMPORTANT! The setting to log in for the first time, defaults to the user name admin and the password admin.*

   *Note: System administrators should previously configure all user names and passwords for those who they allow to log on to the system.*

5. Press **Login**. The Niagara 4100 Welcome Window and menu bar appear (Figure 42).

**Figure 42. Welcome window**

Niagara® 4100
ViewCast
Home
Encoders
Configuration
Status
Maintenance
Log Out
Welcome admin to Niagara 4100
This Web interface provides remote configuration and control of your Niagara 4100 encoding appliance.
From this Web interface, you can:
• View or modify the Encoder settings and assign them to the front panel Preset ABC buttons
• View and modify the Appliance settings
• Configure System Alerts
• View and modify Network Properties
• Change the System Configuration settings
• Manage Encoder Groups
Please register to activate product.

# Registering your product

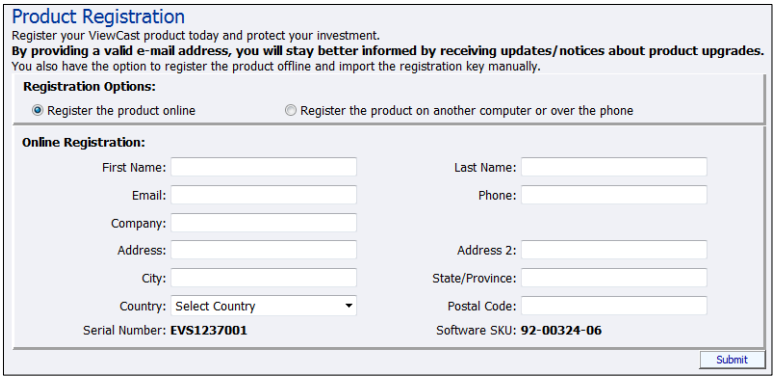
You have 30 days to register your product when you first activate the system. A reminder displays at the bottom of the Home and Encoders pages. You can register your system using three different methods:

- Product Registration page
- ViewCast website
- ViewCast Support help desk (Call 972-488-7157 and provide the serial number and SKU.)

**To register online:**

1. Access the Product Registration page:
   Click **Maintenance ➢ Product Registration**. The Product Registration page displays (Figure 43).

   **Figure 43. Product Registration**



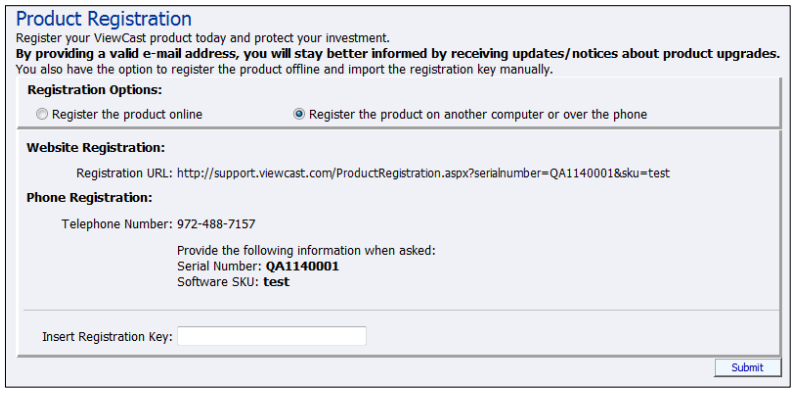

   *Note: The default is **Register the product online**.*

2. Enter your name and contact information in the spaces provided.
3. Click **Submit**. After a few seconds, a confirmation message displays.

**To register at viewcast.com:**

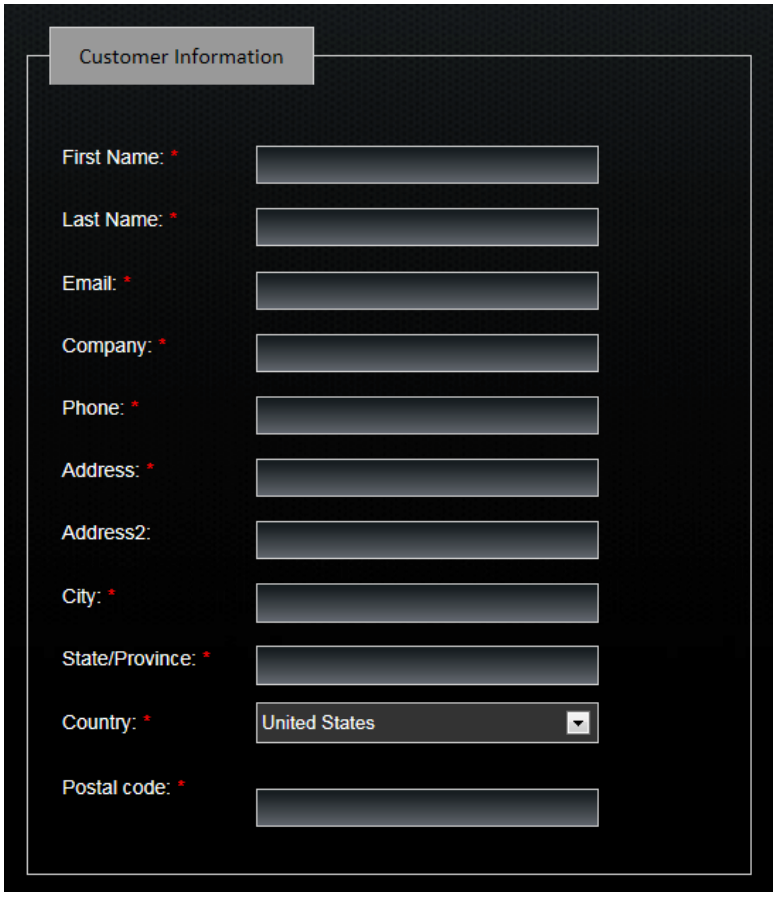
1. Access the Product Registration page:
   Click **Maintenance ➢ Product Registration**. The Product Registration page displays (Figure 43).
2. Click Register the product on another computer or over the phone (Figure 44).

   **Figure 44. Register the product on another computer or over the phone**


Product Registration
Register your ViewCast product today and protect your investment.
By providing a valid e-mail address, you will stay better informed by receiving updates/notices about product upgrades.
You also have the option to register the product offline and import the registration key manually.
Registration Options:
Register the product online
Register the product on another computer or over the phone
Website Registration:
Registration URL: http://support.viewcast.com/ProductRegistration.aspx?serialnumber=QA1140001&sku=test
Phone Registration:
Telephone Number: 972-488-7157
Provide the following information when asked:
Serial Number: QA1140001
Software SKU: test
Insert Registration Key:
Submit

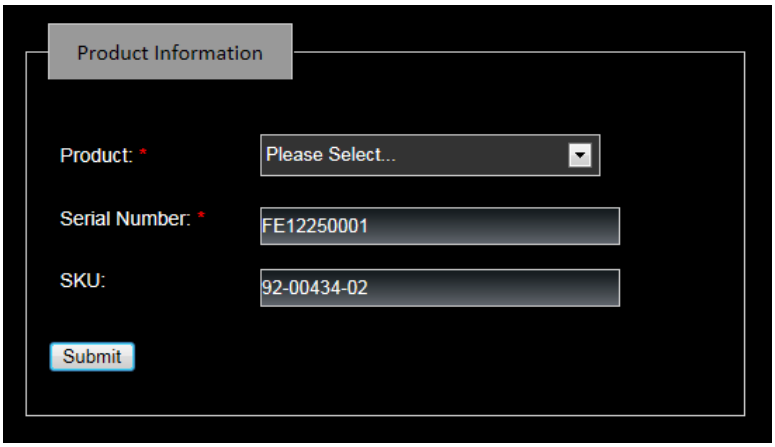
3. Copy the registration URL.
4. From another computer, open a browser and paste the URL into the address bar.
5. Enter your name and contact information in the spaces provided (Figure 45).

**Figure 45. Contact Information**




6. Select the type of product. The serial number and SKU are automatically populated (Figure 46 is for example purposes only).

**Figure 46. Product information**

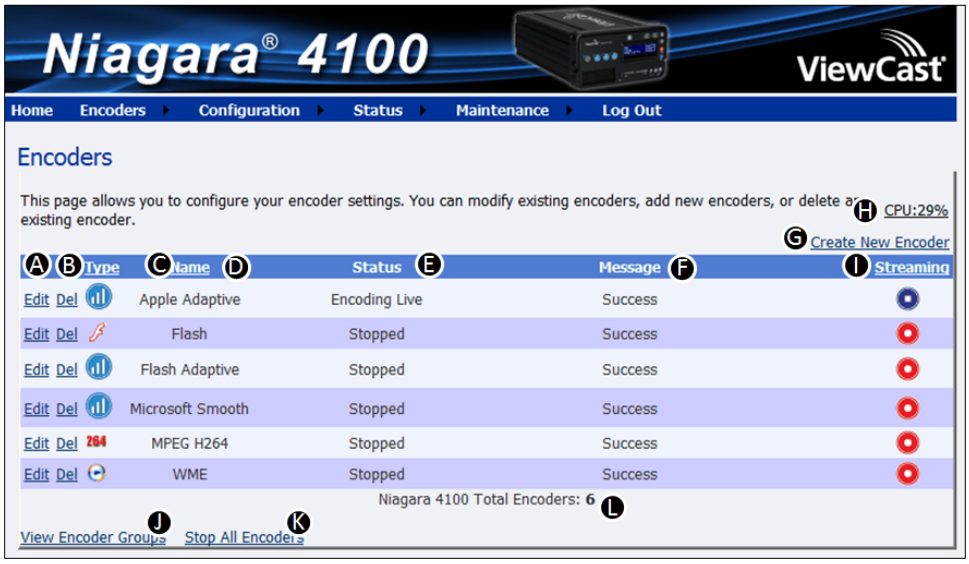



7. Click **Submit**. After a few seconds, a confirmation message displays.

# Viewing all encoders

The Encoders window (Figure 47) provides a list of all of the encoder profiles that you created on the Niagara 4100. On the home page click **Encoders ➢ All Encoders.**

**Figure 47. Encoders window**


Niagara® 4100
ViewCast
Home
Encoders
Configuration
Status
Maintenance
Log Out
Encoders
This page allows you to configure your encoder settings. You can modify existing encoders, add new encoders, or delete an existing encoder.
H CPU:29%
G Create New Encoder
A B Type C Name D Status E Message F I Streaming
Edit Del Apple Adaptive Encoding Live Success
Edit Del Flash Stopped Success
Edit Del Flash Adaptive Stopped Success
Edit Del Microsoft Smooth Stopped Success
Edit Del MPEG H264 Stopped Success
Edit Del WME Stopped Success
Niagara 4100 Total Encoders: 6 L
J View Encoder Groups
K Stop All Encoders

| | |
|---|---|
| **A** | Click this link to edit the encoder properties, streaming settings, and advanced streaming settings. |
| **B** | Click this link to delete an encoder from the list. |
| **C** | Displays the encoder type (for example the Flash icon ). |
| **D** | Displays the name you assigned to the encoder. This name appears on the LCD display on the front panel. |
| **E** | Displays the status of the last action. |
| **F** | Displays the result of the last operation. |
| **G** | Click this link to create a new encoder. |
| **H** | Displays the amount of CPU usage. |
| **I** | Displays as either a blue circle icon (started) or red circle icon (stopped) as the options for streaming for this encoder. You can start or stop an encoder by clicking the icons. |
| **J** | Click this link to view and edit encoder groups. |
| **K** | Click this link to stop all encoder. |
| **L** | Displays the total number of encoders. |

You can also view encoders by clicking on the **View All Encoders** link at the bottom of the Preset A, B, or C window.

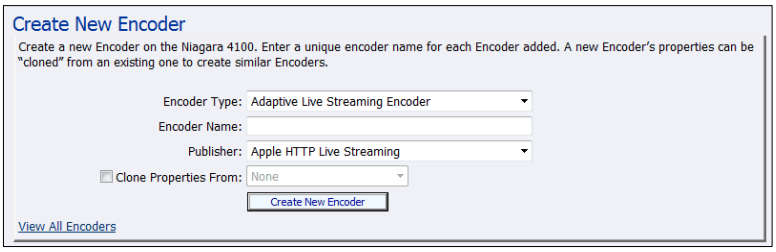
# Creating an encoder

To create an encoder, on the home page click Encoders.

**To create an encoder:**

1. Click the **Create New Encoder** link. The Create New Encoder window displays (Figure 48).

   **Figure 48. Create New Encoder window**


Create New Encoder
Create a new Encoder on the Niagara 4100. Enter a unique encoder name for each Encoder added. A new Encoder's properties can be "cloned" from an existing one to create similar Encoders.
Encoder Type:
Adaptive Live Streaming Encoder
Encoder Name:
Publisher:
Apple HTTP Live Streaming
Clone Properties From:
None
Create New Encoder
View All Encoders

2. Select the **Encoder Type** from the drop-down list.
3. Enter the name of the encoder.

   *Note: Valid characters are alphanumeric, space, dash, and dot.*
4. To use the same properties from another encoder, enable **Clone Properties From**.
5. Select the encoder from the drop-down list.
6. Click **Create New Encoder**.

# Starting an encoder

To start an encoder, on the home page click **Encoders ➢ All Encoders.**

**To start an encoder:**

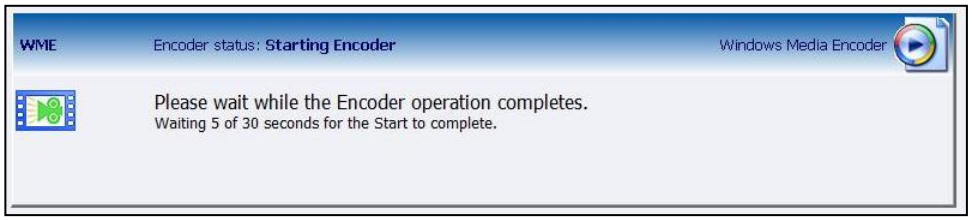
1. Click the red circle **Stopped** icon (Figure 49) in the **Streaming** column for the encoder you want to start streaming.

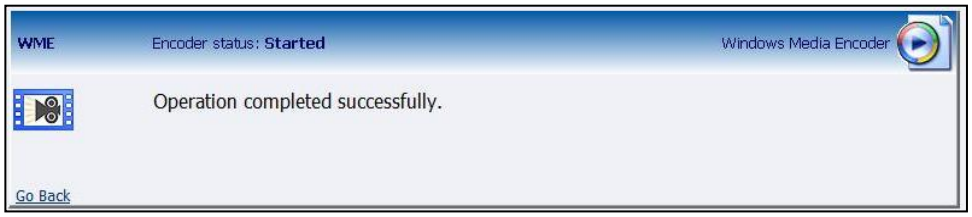
   **Figure 49. Stopped icon**

   Messages appear detailing the encoder start progress (Figure 50).

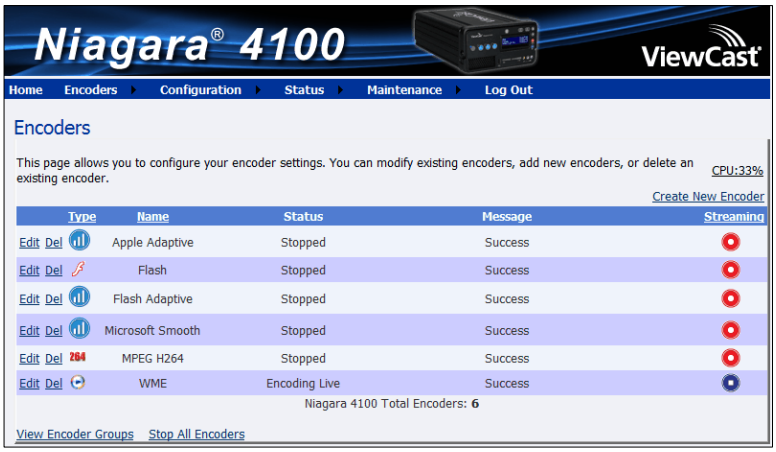
   **Figure 50. Starting encoder**

   
   WME
Encoder status: Starting Encoder
Windows Media Encoder
Please wait while the Encoder operation completes.
Waiting 5 of 30 seconds for the Start to complete.

The Encoders window appears with the encoder status updated and the streaming indicator changes to a blue circle Started icon (Figure 51).

**Figure 51. Encoders window**



# Stopping an encoder

To stop an encoder, on the home page click **Encoders ➢ All Encoders.**

**To stop an encoder:**

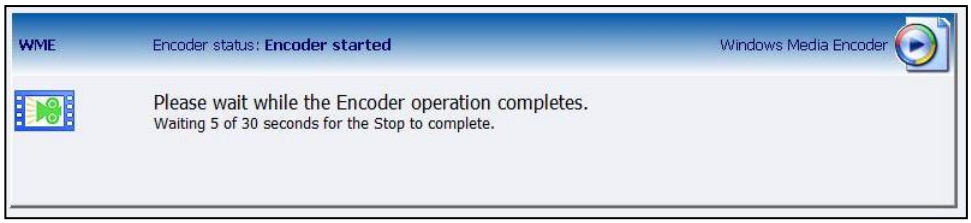
1. Click the blue **Started** icon of the encoder you wish to stop streaming (Figure 52).

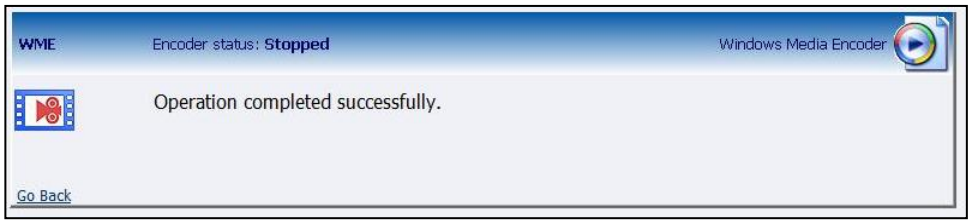
   **Figure 52. Started icon**

   Messages appear detailing the encoder stop progress (Figure 53).

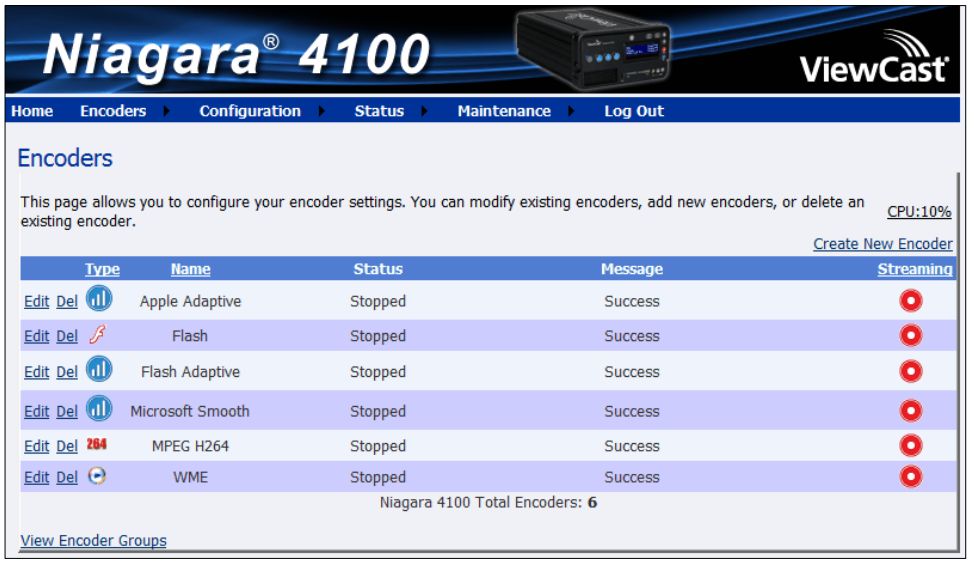
   **Figure 53. Encoder stopped**

   
   WME
Encoder status: Encoder started
Windows Media Encoder
Please wait while the Encoder operation completes.
Waiting 5 of 30 seconds for the Stop to complete.

The Encoders window appears with the encoder status updated to reflect the Stopped mode (Figure 54).

**Figure 54. Encoders window**



# *Advanced Operations*

Advanced operations include but are not limited to the following:

- Editing an Adaptive Apple HTTP encoder
- Editing an Adaptive Adobe Flash encoder
- Editing an Adaptive Microsoft Smooth Streaming encoder
- Editing an Adobe Flash H.264 encoder
- Editing an MPEG4 encoder
- Editing a WME encoder
- Streaming to a TS container

## Editing an Adaptive Apple HTTP encoder

To create an encoder, **Encoders** ➢ **All Encoders** ➢ **Create New Encoder** link ➢ **Encoder Name** field.

When you create a new encoder, the Encoder Properties window appears. The Encoder Properties windows for editing a new encoder or an existing encoder are identical. You must configure the audio and video settings for each encoder type.

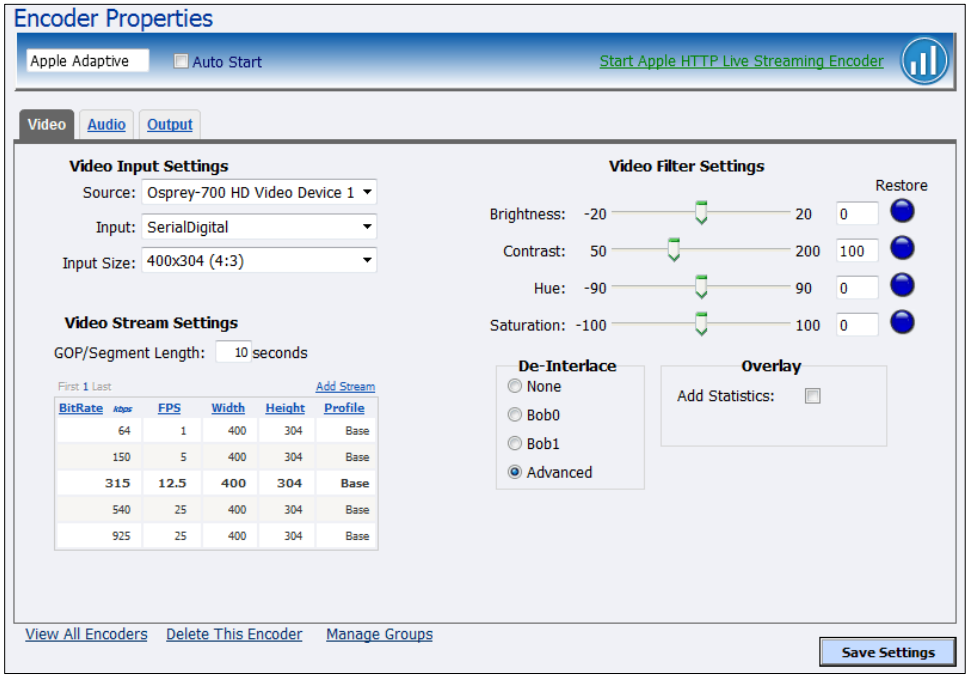
Use the Video, Audio, and Output tabs to edit the settings. Configure the video and audio settings, then the streaming properties. The streaming properties and advanced streaming settings are different for each type of encoder.

From the Adaptive Apple Encoder Properties window (Figure 55), you can set the encoder to start streaming automatically by selecting the **Auto Start** check box. You can also start the encoder from this window by clicking the **Start Apple HTTP Live Streaming Encoder** link in the top right corner of the window.

Click **Encoders** ➢ **All Encoders** from the home page. Then select the **Edit** link next to the adaptive encoder whose properties you wish to modify. The system displays the Encoder Properties window for the selected encoder.

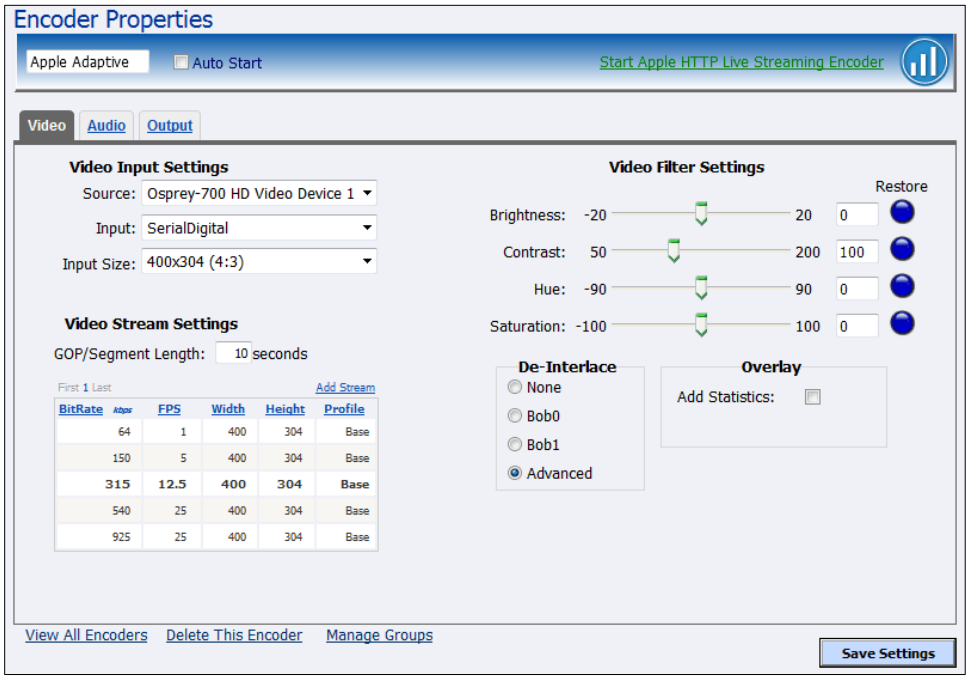
*IMPORTANT! If you make any changes to the Encoder Properties window, you must click* ***Save Settings****. Otherwise, all your changes will be lost.*

**Figure 55. Adaptive Apple HTTP Live Encoder Properties**



# Video tab

**Figure 56. Video tab**




**To configure video settings:**

1. Select the video input **Source** from the drop-down list.
2. The **Input** field setting is **SerialDigital**.

   *IMPORTANT! The video input must match the connectors on the back of the Niagara 4100 and your video source.*
3. In the **Input Size** field, select the pre-determined size of the encoded video from the drop-down list.

   You can also specify a custom size for your video. This customization is useful when you are capturing video to be played on a mobile video-device that requires a non-standard size for compatibility.

   When you click **Custom**, two additional fields appear so you can enter the exact size you want the resulting video to be (Figure 57).

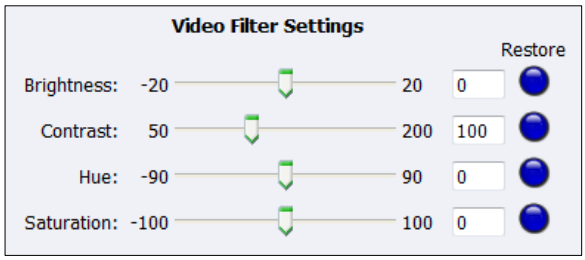
   *Note: The size in the Width and Height field must be divisible by 2.*

   **Figure 57. Custom fields**

   
4. Enter the seconds for the **GOP/Segment Length**.
5. In the adaptive encoder video stream table, indicate which stream the player will use first (see *Adaptive encoder video stream table*).

6. Drag the sliders to adjust the **Brightness**, **Contrast**, **Hue**, and **Saturation** (Figure 58).

**Figure 58. Video Filter Settings**

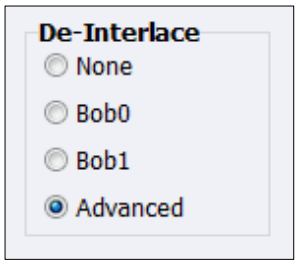



*Note: Click the **Restore** button to the right of the filter to reset the settings to the default.*

7. Click the De-Interlace setting you want to apply. Options include:

- **None**
  – Performs no de-interlacing of any kind.
- **Bob0**
  – Applies inverse telecine de-interlacing to all telecine video.
  – Applies motion adaptive de-interlacing to all video that is not telecine.
  – Switches dynamically between the two modes as the content changes.
  – Available for NTSC video only.
- **Bob1**
  – Drops the redundant fields and reassembles the video in a 24 fps progressive format.
  – Applies inverse telecine de-interlacing to all telecine video.
  – Performs no de-interlacing of video that is not telecine.
  –Available for NTSC video only.
- **Advanced**
  – Is an algorithm for de-interlacing pure video (non-telecine) content.
  – Applies motion adaptive interlacing to all video. It detects which portions of the image are still and which portions are in motion then applies different processing to each scenario.

**Figure 59. De-Interlace settings**




*Note: Telecine and inverse telecine only apply to NTSC video. They are not used for PAL and SECAM video. The system disables Bob0 and Bob1 choices when you select either PAL or SECAM as the video standard.*

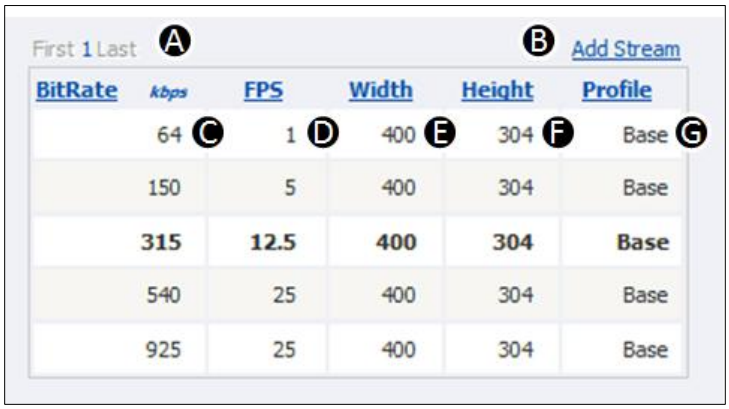
8. Select **Add Statistics** to overlay video statistics within the video stream for diagnostic purposes.
9. Click **Save Settings**.

# Adaptive encoder video stream table

The adaptive encoder video stream table (Figure 60) contains five default streams. You can add a new stream, edit, delete, disable, and set which stream the player will use first. You can sort each column by clicking on the column heading.

The system validates the stream settings according to the capabilities of your Niagara system.

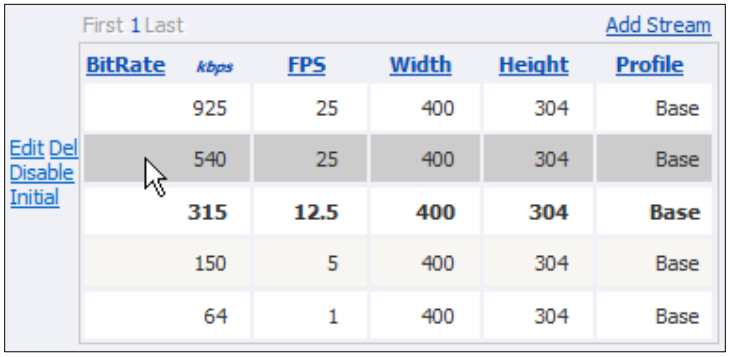
**Figure 60. Adaptive Apple encoder video stream table**




| | |
|---|---|
| **A.** | The table displays five streams at a time. Additional streams display on additional pages. Click the page number to display the streams on that page. You can also click **First** to go to the first page or click **Last** to go to the last page. |
| **B.** | Click this link to add a stream.<br>*Note: If you click **Custom** as the Input Size, the system will automatically adjust the width and height of subsequent streams according to the custom settings.* |
| **C.** | The bit rate displays in kilobits per second. This field can only contain whole numbers.<br>*Note: Two streams at the same bit rate cannot run simultaneously.* |
| **D.** | Displays the frames per second. You can enter up to two decimal places. |
| **E.** | Displays the width of the picture frame in the stream. |
| **F.** | Displays the height of the picture frame in the stream. |
| **G.** | The profile field has two settings:<br>• Base – This profile is typically for video conferencing and mobile applications and has the lowest demands on CPU load and memory usage, but lowest resulting quality.<br>• Main – This profile is targeted at standard-definition TV. This profile is not acceptable for streaming to iPhone mobile devices. |

When you hover your cursor over a stream setting, additional functions display (Figure 61).

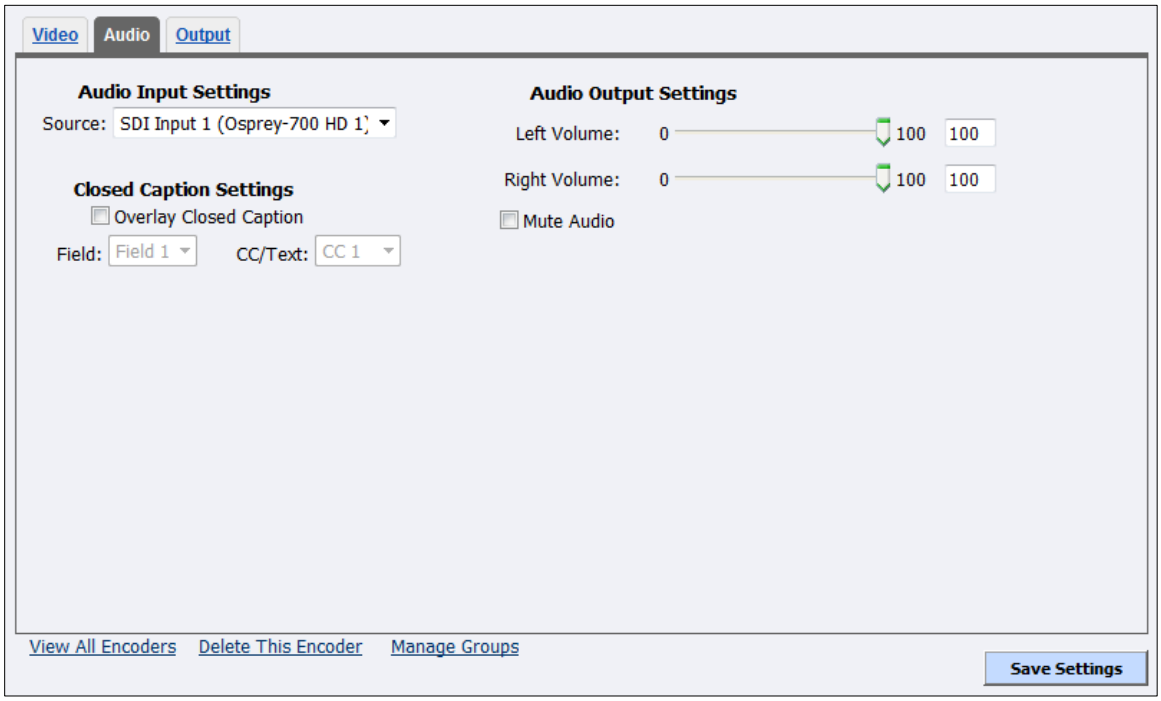
**Figure 61. Additional functions**




| | |
|---|---|
| **Edit** | Click this link to change the settings for a particular stream. Click **Update** to accept the changes.<br>*Note: Click **Cancel** to stop this action.* |
| **Del** | Click this link to delete the stream. |
| **Disable** | Click this link to disable this stream. The settings are still visible but appear to be "crossed out." |
| **Initial** | Click this link to have the system use this stream first. The settings for the initial stream appear in bold. |

# Audio tab

**Figure 62. Audio tab**




**To configure audio settings:**

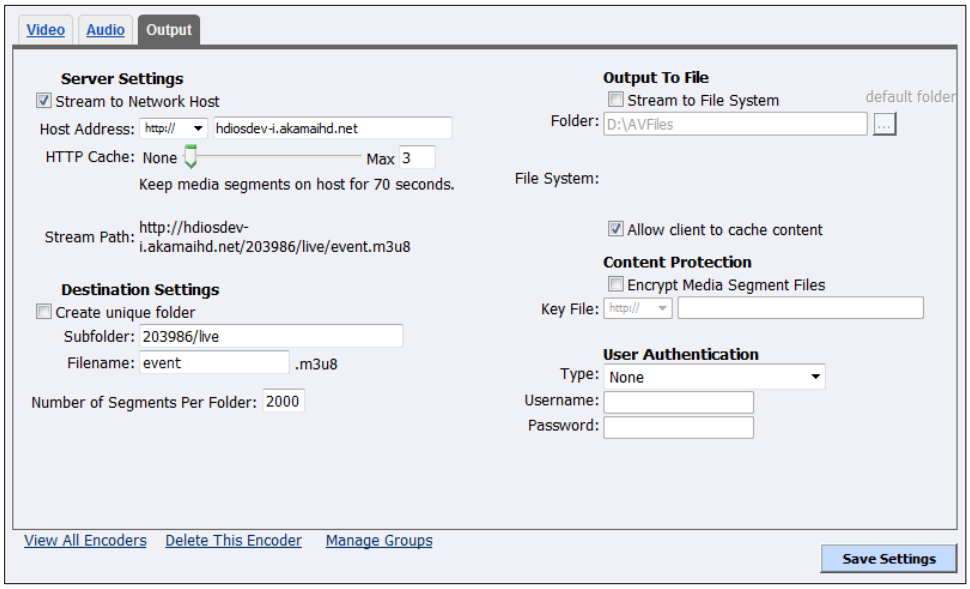
1. In the **Source** field, click a device from the drop-down list.

   *Note: Because the Niagara 4100 is a single-channel encoder, you can only connect and stream one audio and video source at any given time. However, you can encode the same audio and video at multiple data rates and multiple formats to provide the best user experience for different viewing audiences.*

2. Select the **Overlay Closed Caption** check box to enable overlay closed captions. Field 1 CC1 is the default.
3. Drag the sliders to adjust the **Left Volume** and **Right Volume**.
4. (Optional) Select **Mute Audio** to silence the audio.
5. Click **Save Settings**.

# Output tab

**Figure 63. Output tab**



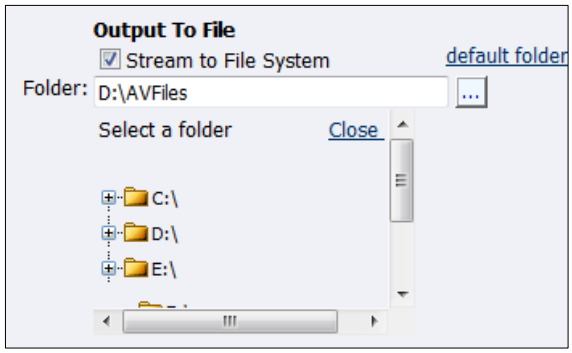

**To configure output settings:**

1. Select **Stream to Network Host**.
   *CAUTION!: Simultaneously publishing to server and file system increases CPU usage.*
2. Select the **Host Address**:
   - http://
   - ftp://

   *Note: When you select **ftp://**, the **Passive FTP Mode** displays. Select this field to use passive FTP mode or clear this field to use active FTP mode.*
3. Enter the address in the next field.
4. Enter the maximum **HTTP Cache** by dragging the slider for the number of files to maintain.
   *Note: The **Stream Path** that displays is a combination of the **Host Address**, **Subfolder**, and **Filename**.*
5. Select **Create unique Subfolder** to create a file that the system does not overwrite.
   *Note: The format is Subfolder_YYMMDD_HHMMSS.*
6. Enter the name of the **Subfolder** used in the network destination and/or the local file system full filename.
7. Enter the name of the variant playlist file in the **File Name** field.
8. Enter the **Number of Segments Per Folder**.
9. Select **Stream to File System** to enable archiving content to the file system.
10. Accept the default location that displays in the **Folder** field or choose your own location for the file (Figure 71). To choose your own personal location, select the link (horizontal ellipses or …) to the right of the **Folder** field to display the options.

    *Note: By default, the system sets this folder to D:\AVFiles. See* Exporting captured video files

*for instructions on saving video files to a USB device.*




*WARNING! You can only save media files to drive D. Check drive properties for available free space to determine your storage capacity.*

*A better practice would be to use a remote file server to save a file or to save it to a remote drive. If you inadvertently fill all available space, you risk losing your stream during a streaming event.*

*Note: The File System that displays is a combination of the **Folder**, **Subfolder**, and **Filename**.*

11. Select **Allow client to cache content**.
12. Select **Encrypt Media Segment Files** to protect the content.
13. Select the **Key File**.

    *Note: **http://** is currently the only choice.*

14. Enter the **URL** where the Key File resides.
15. Enter the user authentication **Type**. If the host address is:
    - http:// the selections are **None** and **Akamai**

    *Note: If you select Akamai, you must set the time zone according to where the Niagara 4100 is located. To change the time zone:*
    *1. Right click on the time in the system tray.*
    *2. Click on **Adjust Date/Time**.*
    *3. In the Date and Time window, click **Change time zone**.*
    *4. Click on the appropriate time zone from the drop-down list and click **OK**.*
    *5. Click **Change date and time**.*
    *6. In the Date and Time Settings window, enter the current time and click **OK**. The time must be as exact as possible.*

    - ftp:// the selections are **None** or **Ftp**.
16. Enter the **Username**.
17. Enter the **Password**.
18. Click **Save Settings**.

# Editing an Adaptive Adobe Flash encoder

To create an encoder, **Encoders ➢ All Encoders ➢ Create New Encoder** link ➢ **Encoder Name** field.

When you create a new encoder, the Encoder Properties window appears. The Encoder Properties windows for editing a new encoder or an existing encoder are identical. You must configure the audio and video settings for each encoder type.

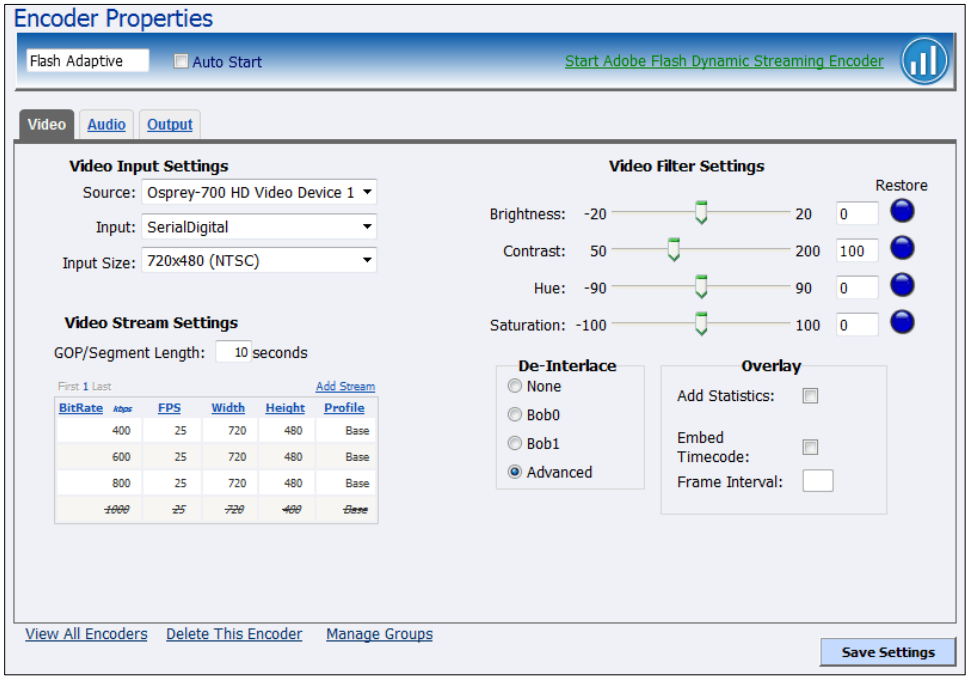
Use the Video, Audio, and Output tabs to edit the settings. Begin with configuring the video and audio settings, then the streaming properties. The streaming properties and advanced streaming settings are different for each type of encoder.

From the Adaptive Adobe Flash Encoder Properties window (Figure 64), you can set the encoder to start streaming automatically by selecting the **Auto Start** check box. You can also start the encoder from this window by clicking the **Start Adobe Flash Dynamic Streaming Encoder** link in the top right corner of the window.

Click **Encoders ➢ All Encoders** from the home page. Then select the **Edit** link next to the Adaptive Adobe Flash encoder whose properties you wish to modify. The system displays the Encoder Properties window for the selected encoder.

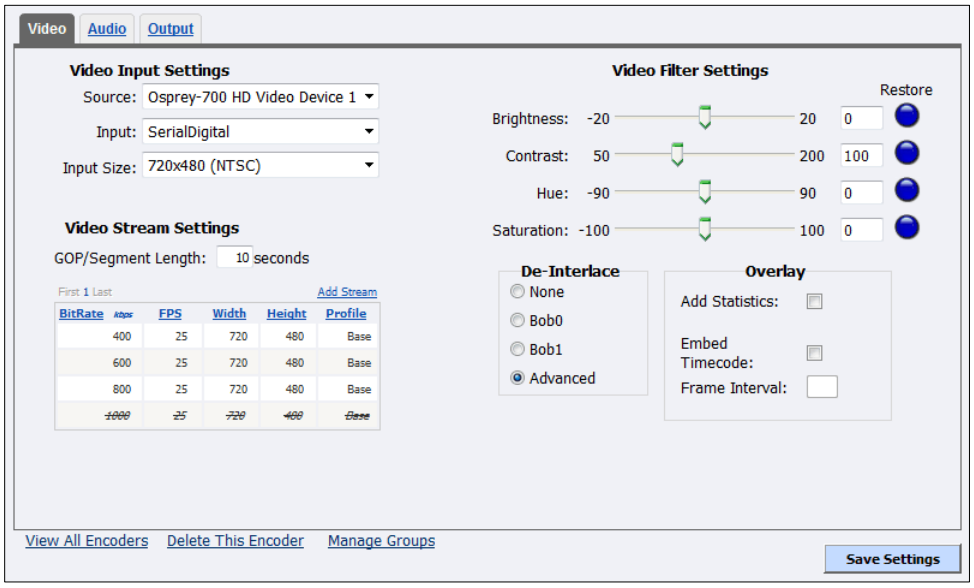
*IMPORTANT! If you make any changes to the Encoder Properties window, you must click **Save Settings**. Otherwise, all your changes will be lost.*

**Figure 64. Adaptive Adobe Flash Encoder Properties**



# Video tab

**Figure 65. Video tab**

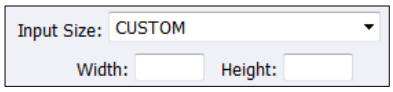



**To configure video settings:**

1. Select the video input **Source** from the drop-down list.
2. In the **Input** field, the video input is **SerialDigital**.
3. In the **Input Size** field, select the pixel size of the encoded video from the pre-determined sizes in the drop-down list.
   You can also specify a custom size for your video. This customization is useful when you are capturing video to be played on a mobile video-device that requires a non-standard size for compatibility.
   When you click **Custom**, two additional fields appear so you can enter the exact size you want the resulting video to be (Figure 66).

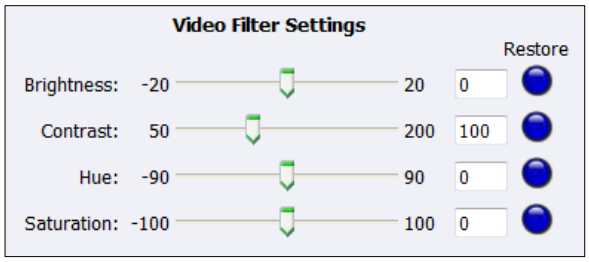
   *Note: The size in the Width and Height field must be divisible by 2.*

   **Figure 66. Custom fields**

4. Select the **Frame Rate** from the drop-down list.
5. Enter the seconds for the **GOP/Segment Length**.
6. Drag the sliders to adjust the **Brightness**, **Contrast**, **Hue**, and **Saturation** (Figure 67).

   **Figure 67. Video Filter Settings**

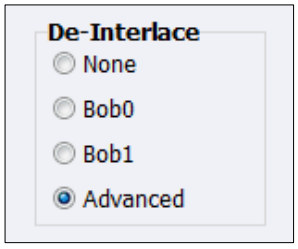



*Note: Click the **Restore** button to the right of the filter to reset the settings to the default.*

7. Click the De-Interlace setting you want to apply (Figure 68). Options include:

   - **None**
     – Performs no de-interlacing of any kind.
   - **Bob0**
     – Applies inverse telecine de-interlacing to all telecine video.
     – Applies motion adaptive de-interlacing to all video that is not telecine.
     – Switches dynamically between the two modes as the content changes.
     – Available for NTSC video only.
   - **Bob1**
     – Drops the redundant fields and reassembles the video in a 24 fps progressive format.
     – Applies inverse telecine de-interlacing to all telecine video.
     – Performs no de-interlacing of video that is not telecine.
     –Available for NTSC video only.
   - **Advanced**
     – Is an algorithm for de-interlacing pure video (non-telecine) content.
     – Applies motion adaptive interlacing to all video. It detects which portions of the image are still and which portions are in motion then applies different processing to each scenario.

**Figure 68. De-Interlace settings**




*Note: Telecine and inverse telecine only apply to NTSC video. They are not used for PAL and SECAM video. The system disables Auto and Inverse Telecine choices when you select either PAL or SECAM as the video standard.*

8. Select **Add Statistics** to overlay video statistics within the video stream for diagnostic purposes.
9. Select **Embed Timecode** to enable embed system time as timecode. This will tag individual video frames with timecode data. This feature should be used if embedded timecode is required but your capture device cannot generate it.
10. Specify the frame interval at which timecode should be embedded into the video stream in

the **Frame Interval** field.

O=disabled

The range is 1 to 30 frames.

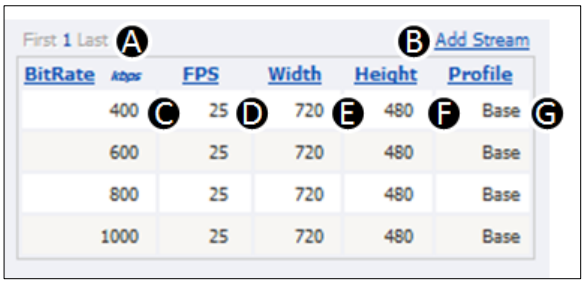
11. Click **Save Settings**.

# Adaptive encoder video stream table

The adaptive encoder video stream table (Figure 69) contains five default streams. You can add a new stream, edit, delete, and disable. You can sort each column by clicking on the column heading.

The system validates the stream settings according to the capabilities of your Niagara system.

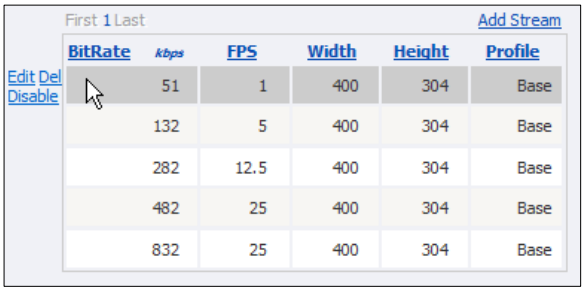
**Figure 69. Adaptive Flash encoder video stream table**




| | |
|---|---|
| **A.** | The table displays five streams at a time. Additional streams display on additional pages. Click the page number to display the streams on that page. You can also click **First** to go to the first page or click **Last** to go to the last page. |
| **B.** | Click this link to add a stream.<br>*Note: If you click **Custom** as the Input Size, the system will automatically adjust the width and height of subsequent streams according to the custom settings.* |
| **C.** | The bit rate displays in kilobits per second. This field can only contain whole numbers.<br>*Note: Two streams at the same bit rate cannot run simultaneously.* |
| **D.** | Displays the frames per second. You can enter up to two decimal places.<br>*Note: These FPS roles will usually be all the same or divisible by ½, ¼, ⅛ of the highest number for any of the streams. For example, 25, 12.5, 5, 1. A "valid" but unsupported entry will be rounded to the nearest supported FPS rate automatically.* |
| **E.** | Displays the width of the stream of the picture frame within the stream. |
| **F.** | Displays the height of the stream of the picture frame within the stream. |
| **G.** | The profile field has two settings:<br>• Base – This profile is typically for video conferencing and mobile applications and has the lowest demands on CPU load and memory usage, but lowest resulting quality.<br>• Main – This profile is targeted at standard-definition TV. |

When you hover your cursor over a stream setting, additional functions display (Figure 70).

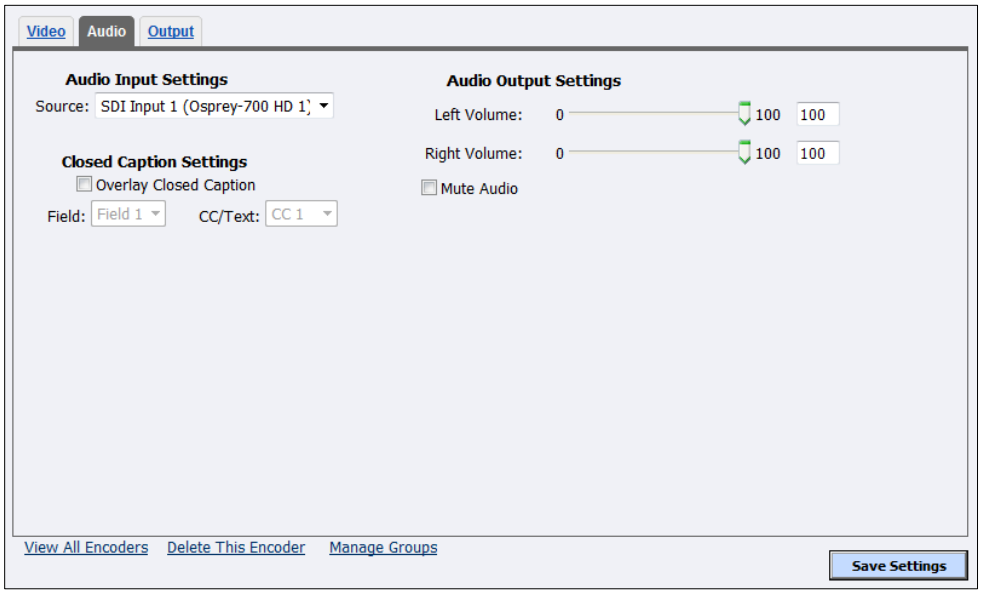
**Figure 70. Additional functions**




| | |
|---|---|
| **Edit** | Click this link to change the settings for a particular stream. Click **Update** to accept the changes.<br>*Note: Click **Cancel** to stop this action.* |
| **Del** | Click this link to delete the stream. |
| **Disable** | Click this link to disable this stream. The settings are still visible but appear to be "crossed out." |

# Audio tab

**Figure 71. Audio tab**




**To configure audio settings:**

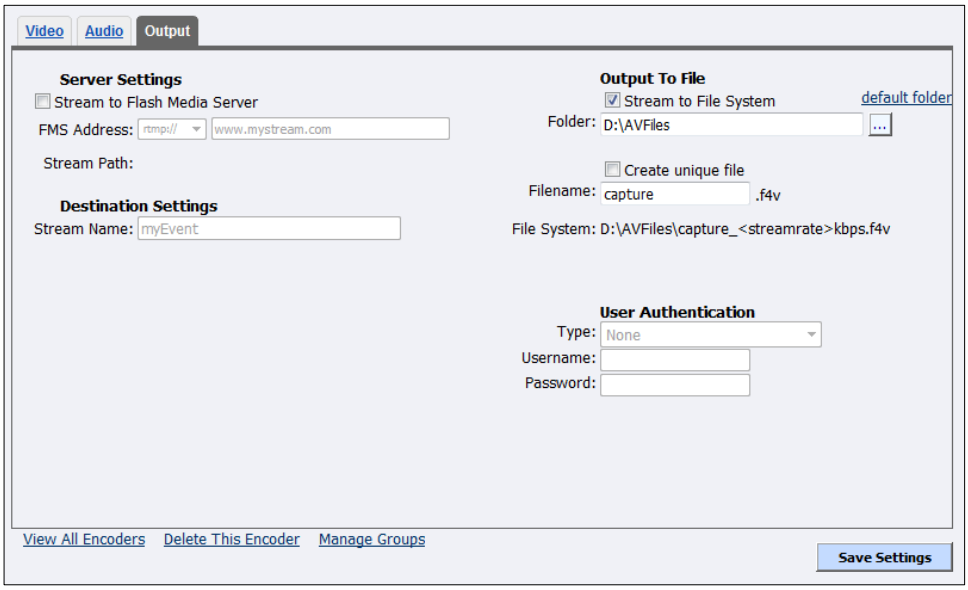
1. In the **Source** field, select an audio source from the drop-down list:

   *IMPORTANT! The audio input must match the connectors on the back of the Niagara 4100 and your audio source.*

2. Select the Overlay Closed Caption check box to enable overlay closed captions. Field 1 CC1 is the default setting.
3. Drag the sliders to adjust the **Left Volume** and **Right Volume**.
4. (Optional) Select **Mute Audio** to silence the audio.
5. Click **Save Settings**.

# Output tab

**Figure 72. Adaptive Flash Output tab**




**To configure output settings:**

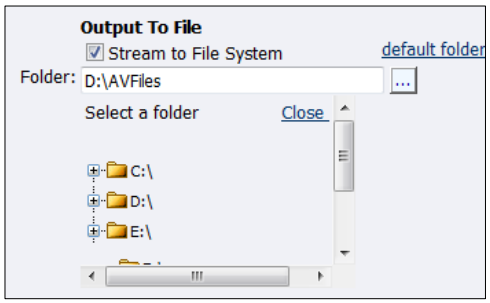
1. Select **Stream to Flash Media Server**.
2. Enter the destination **FMS Address**.

   *Note: The **Stream Path** that displays is a combination of the **FMS address** and the stream name.*
3. Enter the **Stream Name**.

   *Note: The system accepts the **%v** parameter for video bitrate, **%i** for indexing, and **%b** for overall bitrate which is compatible with Adobe Flash media encoder.*
4. Select **Stream to File System** to enable archiving content to the file system.
5. Accept the default location that displays in the **Folder** field or choose your own location for the file. To choose your own personal location, select the link (horizontal ellipses or … ) to the right of the **Folder** field and display the options (Figure 73).

   *Note: By default, the system sets this folder to D:\AVFiles. See* Connecting an external storage device *for instructions on saving video files to a USB storage device.*

**Figure 73. Select a folder**




*WARNING! You can only save media files to drive D. Check drive properties for available*

*free space to determine your storage capacity.*

*A better practice would be to use a Flash Media server to save a file or to save it to a remote drive. If you fill all available space, you risk losing your stream during a streaming event.*

6. Select **Create a Unique file**.
7. Enter the **Filename**.

   *Note: The **File System** that displays is a combination of the **Folder** and **Filename**.*
8. Select the user authentication **Type**:
   - None
   - Adobe
   - Akamai
   - Limelight
9. Enter the **Username**.

   *Note: You can enter a maximum of 80 characters.*
10. Enter the **Password**.

    *Note: You can enter a maximum of 20 characters.*
11. Click **Save Settings**.

# Editing an Adaptive Smooth Streaming encoder

To create an encoder, **Encoders** ➢ **All Encoders** ➢ **Create New Encoder** link ➢ **Encoder Name** field.

When you create a new encoder, the Encoder Properties window appears. The Encoder Properties windows for editing a new encoder or an existing encoder are identical. You must configure the audio and video settings for each encoder type.

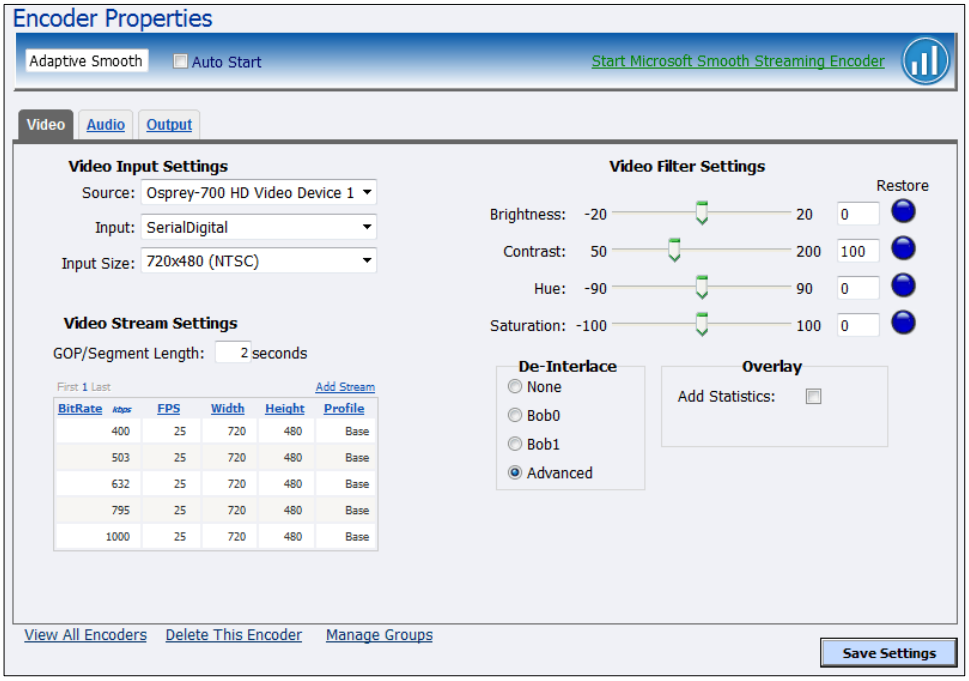
Use the Video, Audio, and Output tabs to edit the settings. Begin with configuring the video and audio settings, then the streaming properties. The streaming properties and advanced streaming settings are different for each type of encoder.

From the Adaptive Smooth Streaming Properties window (Figure 74), you can set the encoder to start streaming automatically by selecting the **Auto Start** check box. You can also start the encoder from this window by clicking the **Start Microsoft Smooth Streaming Encoder** link in the top right corner of the window.

Click **Encoders** ➢ **All Encoders** from the home page. Then select the **Edit** link next to the Adaptive Smooth Streaming encoder whose properties you wish to modify. The system displays the Encoder Properties window for the selected encoder.

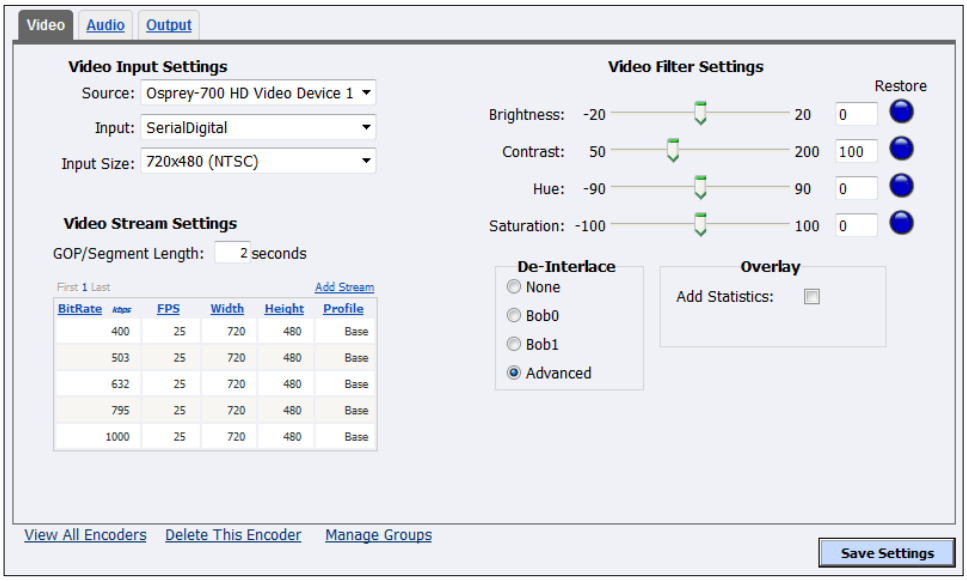
*IMPORTANT! If you make any changes to the Encoder Properties window, you must click* ***Save Settings****. Otherwise, all your changes will be lost.*

**Figure 74. Adaptive Smooth Streaming Encoder Properties**



# Video tab

**Figure 75. Adaptive Smooth Streaming Video tab**




**To configure video settings:**

1. Select the video input **Source** from the drop-down list.
2. In the Input field, the video input is **SerialDigital**.
3. In the **Input Size** field, select the pixel size of the encoded video from the pre-determined sizes.
   You can also specify a custom size for your video. This customization is useful when you are capturing video to be played on a mobile video-device that requires a non-standard size for compatibility.
   When you click **Custom**, two additional fields appear so you can enter the exact size you want the resulting video to be (Figure 76).

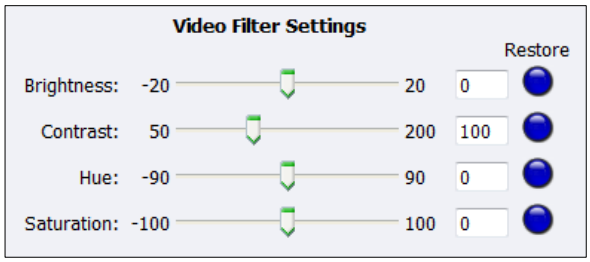
   *Note: The size in the Width and Height field must be divisible by 2.*

   **Figure 76. Custom fields**

4. In the **GOP/Segment Length** field, enter the length in seconds for the Group of Pictures structure.
   - A shorter time will produce more frequent I-frames, a better picture quality, and a more editable stream.
   - A longer time will have better compression, a less editable stream and the quality may suffer.
5. Drag the sliders to adjust the **Brightness**, **Contrast**, **Hue**, and **Saturation** (Figure 77).

   **Figure 77. Video Filter Settings**

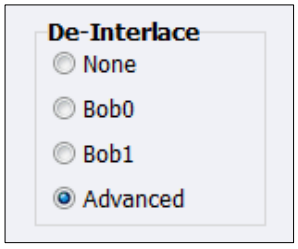



*Note: Click the **Restore** button to the right of the filter to reset the settings to the default.*

6. Click the De-Interlace setting you want to apply. Options include:

   - **None**
     – Performs no de-interlacing of any kind.
   - **Bob0**
     – Applies inverse telecine de-interlacing to all telecine video.
     – Applies motion adaptive de-interlacing to all video that is not telecine.
     – Switches dynamically between the two modes as the content changes.
     – Available for NTSC video only.
   - **Bob1**
     – Drops the redundant fields and reassembles the video in a 24 fps progressive format.
     – Applies inverse telecine de-interlacing to all telecine video.
     – Performs no de-interlacing of video that is not telecine.
     –Available for NTSC video only.
   - **Advanced**
     – Is an algorithm for de-interlacing pure video (non-telecine) content.
     – Applies motion adaptive interlacing to all video. It detects which portions of the image are still and which portions are in motion. It then applies different processing to each scenario.

**Figure 78. De-Interlace settings**




*Note: Telecine and inverse telecine only apply to NTSC video. They are not used for PAL and SECAM video. The system disables Bob0 and Bob1 choices when you select either PAL or SECAM as the video standard.*

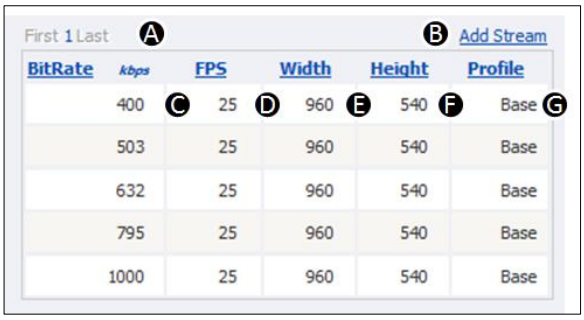
7. Select **Add Statistics** to overlay video statistics within the video stream for diagnostics purposes.
8. Click **Save Settings**.

# Adaptive encoder video stream table

The adaptive encoder video stream table (Figure 79) contains five default streams. You can add a new stream, edit, delete, and disable. You can sort each column by clicking on the column heading.

The system validates the stream settings according to the capabilities of your Niagara system.

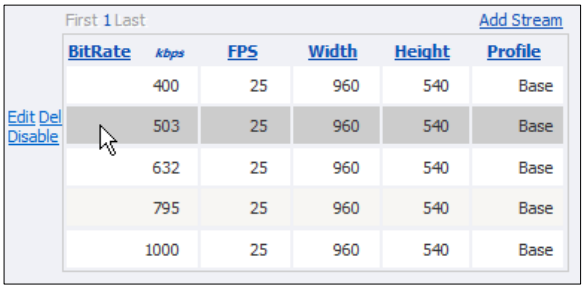
**Figure 79. Adaptive encoder video stream table**




| | |
|---|---|
| **A.** | The table displays five streams at a time. Additional streams display on additional pages. Click the page number to display the streams on that page. You can also click **First** to go to the first page or click **Last** to go to the last page. |
| **B.** | Click this link to add a stream.<br>*Note: If you click **Custom** as the Input Size, the system will automatically adjust the width and height of subsequent streams according to the custom settings.* |
| **C.** | The bit rate displays in kilobits per second. This field can only contain whole numbers.<br>*Note: Two streams at the same bit rate cannot run simultaneously.* |
| **D.** | Displays the frames per second. You can enter up to two decimal places.<br>*Note: These FPS roles will usually be all the same or divisible by ½, ¼, ⅛ of the highest number for any of the streams. For example, 25, 12.5, 5, 1. A "valid" but unsupported entry will be rounded to the nearest supported FPS rate automatically.* |
| **E.** | Displays the width of the picture frame in the stream. |
| **F.** | Displays the height of the picture frame in the stream. |
| **G.** | The profile field has two settings:<br>• Base – This profile is typically for video conferencing and mobile applications and has the lowest demands on CPU load and memory usage, but lowest resulting quality.<br>• Main – This profile is targeted at standard-definition TV. |

When you hover your cursor over a stream setting, additional functions display (Figure 80).

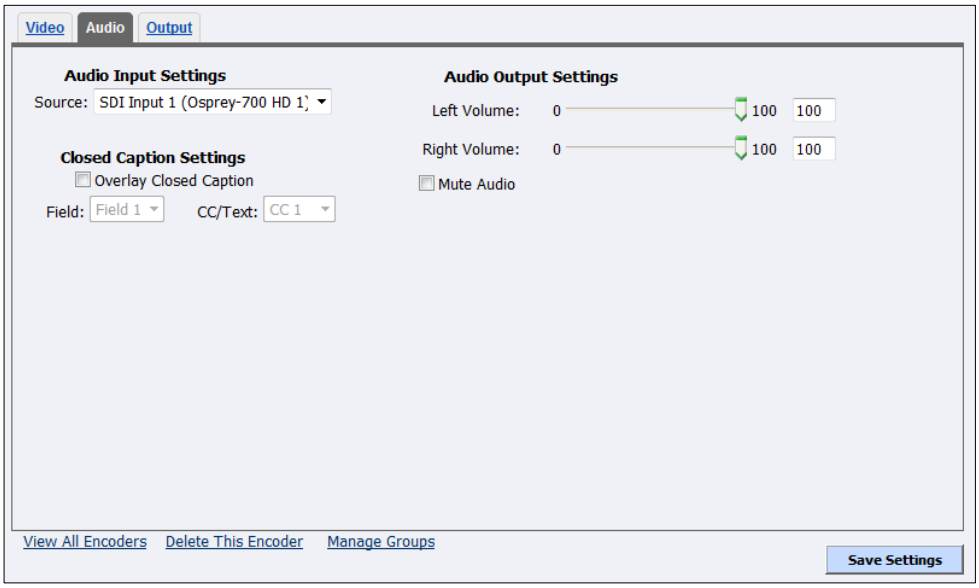
**Figure 80. Additional functions**




| | |
|---|---|
| **Edit** | Click this link to change the settings for a particular stream. Click **Update** to accept the changes.<br>*Note: Click **Cancel** to stop this action.* |
| **Del** | Click this link to delete the stream. |
| **Disable** | Click this link to disable this stream. The settings are still visible but appear to be "crossed out." |

# Audio tab

**Figure 81. Adaptive Smooth Streaming Audio tab**




**To configure audio settings:**

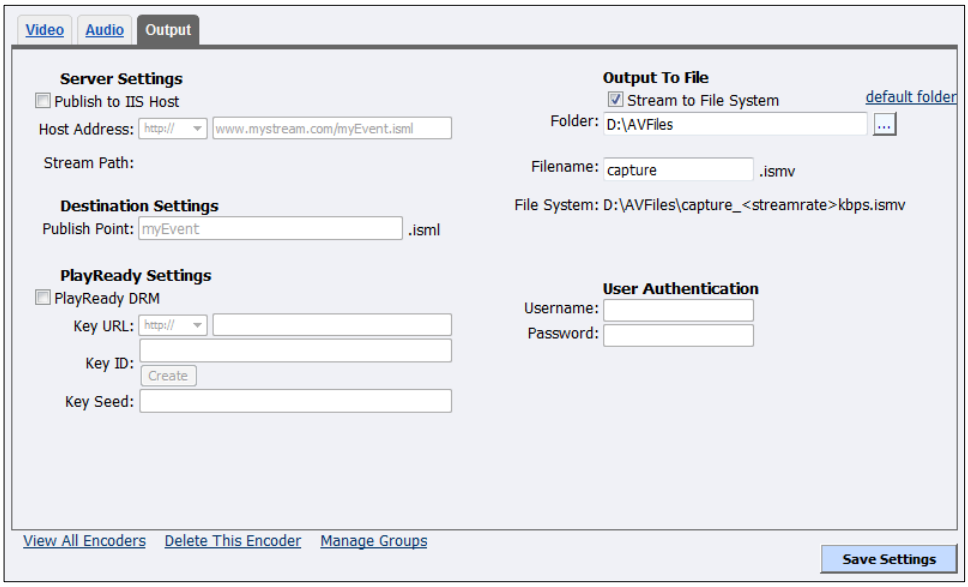
1. In the **Source** field, select an audio source from the drop-down list.

   *IMPORTANT! The audio input must match the connectors on the back of the system and your audio source.*

2. Select the **Overlay Closed Caption** check box to enable overlay closed captions. Field 1 CC 1 is the default setting.
3. Drag the sliders to adjust the **Left Volume** and **Right Volume**.
4. (Optional) Select **Mute Audio** to silence the audio.
5. Click **Save Settings**.

# Output tab

**Figure 82. Adaptive Smooth Streaming Output tab**



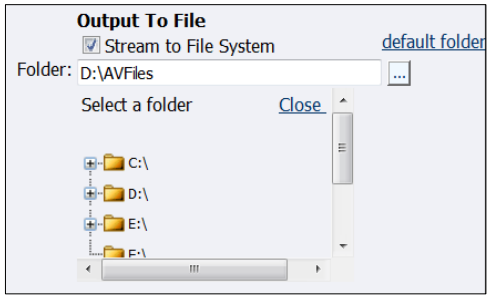

**To configure output settings:**

1. Select **Publish to IIS Host**.
2. Enter the destination **Host Address**.

   *Note: The **Stream Path** that displays is a combination of the host address and the publish point.*
3. Enter the **Publish Point**.
4. Select **PlayReady DRM** to enable Digital Rights Management support. PlayReady requires external License Server provider support. The URL and the seed must be acquired from the license hosting provider.
5. Select the **Key URL**:
   - http://
   - https://
6. Enter the PlayReady key **URL**.
7. Enter the **Key ID**.
8. Click **Create** to generate a unique key ID.
9. Enter the **Key Seed**.
10. Click **Stream to File System**.
11. Accept the default location that displays in the Folder field or choose your own location for the file. To choose your own personal location select the link (horizontal ellipses or … ) to the right of the Folder field and display the options (Figure 83).

    *Note: By default, the system sets this folder to D:\AVFiles. See* Exporting captured video files *for instructions on saving video files to a USB storage device.*

**Figure 83. Select a folder**




*WARNING! You can only save media files to drive D. Check drive properties for available free space to determine your storage capacity.*

*A better practice would be to use a remote file server to save a file or to save it to a remote drive. If you fill all available space, you risk losing your stream during a streaming event.*

*Smooth Streaming files created when you enable Output to File are not designed to be played locally by a media player but should be hosted on an IIS server for Video On Demand services.*

12. Enter the **Username**.
    *Note: You can enter a maximum of 80 characters.*

    *IIS authentication types supported are Basic and Digest.*
13. Enter the **Password**.
    *Note: You can enter a maximum of 20 characters.*
14. Click **Save Settings**.

# Editing an Adobe Flash H.264 encoder

To create an encoder, **Encoders** ➢ **All Encoders** ➢ **Create New Encoder** link ➢ **Encoder Name** field.

When you create a new encoder, the Encoder Properties window appears. The Encoder Properties windows for editing a new encoder or an existing encoder are identical. You must configure the audio and video settings for each encoder type.

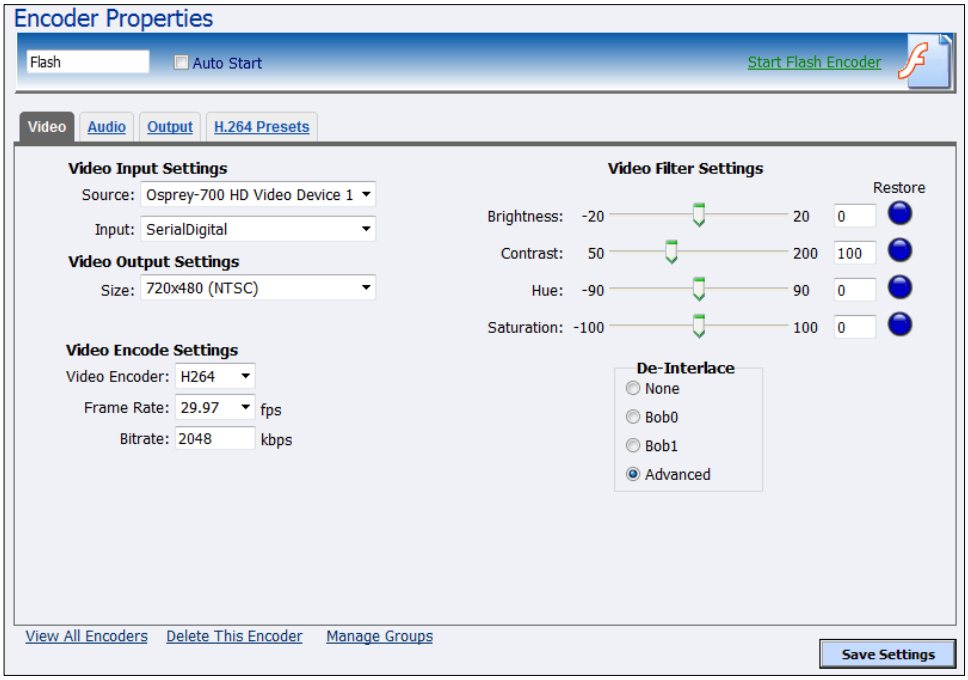
Use the Video, Audio, Output, and H.264 Presets tabs to edit the settings. Configure the video and audio settings, then the streaming properties. The streaming properties and advanced streaming settings are different for each type of encoder.

From the Flash Encoder Properties window (Figure 84), you can set the encoder to start streaming automatically by clicking the **Auto Start** checkbox. You can also start the encoder from this window by clicking the **Start Flash Encoder** link in the top right corner of the window.

Click **Encoders** ➢ **All Encoders** from the home page. Then select the **Edit** link next to the encoder whose properties you wish to modify. The system displays the Encoder Properties window for the selected encoder.

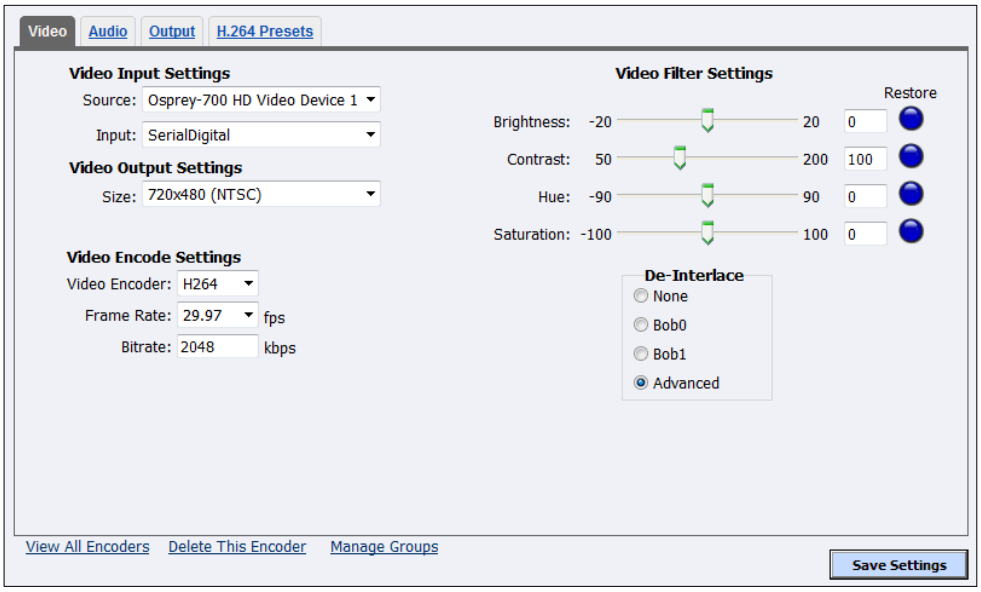
*IMPORTANT! If you make any changes to the Encoder Properties window, you must click **Save Settings**. Otherwise, all your changes will be lost.*

**Figure 84. Flash Encoder Properties**



# Video tab

**Figure 85. Video tab**




**To configure video input settings:**

1. In the **Source** field, click a device from the drop-down list.
2. In the **Size** field, click the pixel size of the encoded video from the drop-down list.
   You can also specify a custom size for your video. This customization is useful when you are capturing video to be played on a mobile video-device that requires a non-standard size for compatibility.
   When you click **Custom**, two additional fields appear so you can enter the exact size you want the resulting video to be (Figure 86).

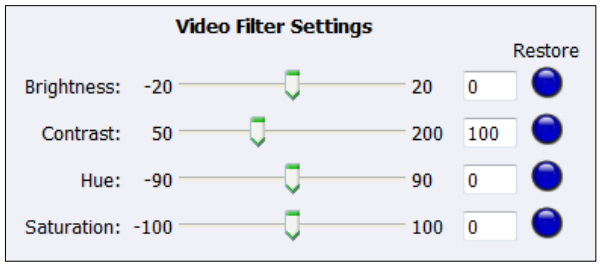
   *Note: The size in the Width and Height field must be divisible by 2.*

   **Figure 86. Custom fields**

3. Select the **Video Encoder** from the drop-down list.
4. Select the **Frame Rate** from the drop-down list.
5. Enter the **Bitrate**.
6. Drag the sliders to adjust the **Brightness**, **Contrast**, **Hue**, and **Saturation** (Figure 87).

   **Figure 87. Video Filter Settings**

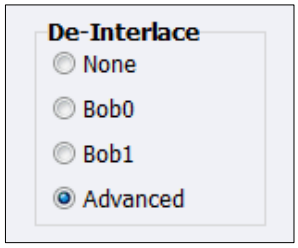



*Note: Click **Restore** to the right of the filter to reset the settings to the default.*

7. Click the **De-Interlace** setting you want to apply (Figure 88). Options include:

- **None**
  – Performs no de-interlacing of any kind.
- **Bob0**
  – Applies inverse telecine de-interlacing to all telecine video.
  – Applies motion adaptive de-interlacing to all video that is not telecine.
  – Switches dynamically between the two modes as the content changes.
  – Available for NTSC video only.
- **Bob1**
  – Drops the redundant fields and reassembles the video in a 24 fps progressive format.
  – Applies inverse telecine de-interlacing to all telecine video.
  – Performs no de-interlacing of video that is not telecine.
  –Available for NTSC video only.
- **Advanced**
  – Is an algorithm for de-interlacing pure video (non-telecine) content.
  – Applies motion adaptive interlacing to all video. It detects which portions of the image are still and which portions are in motion then applies different processing to each scenario.

**Figure 88. De-Interlace Settings**

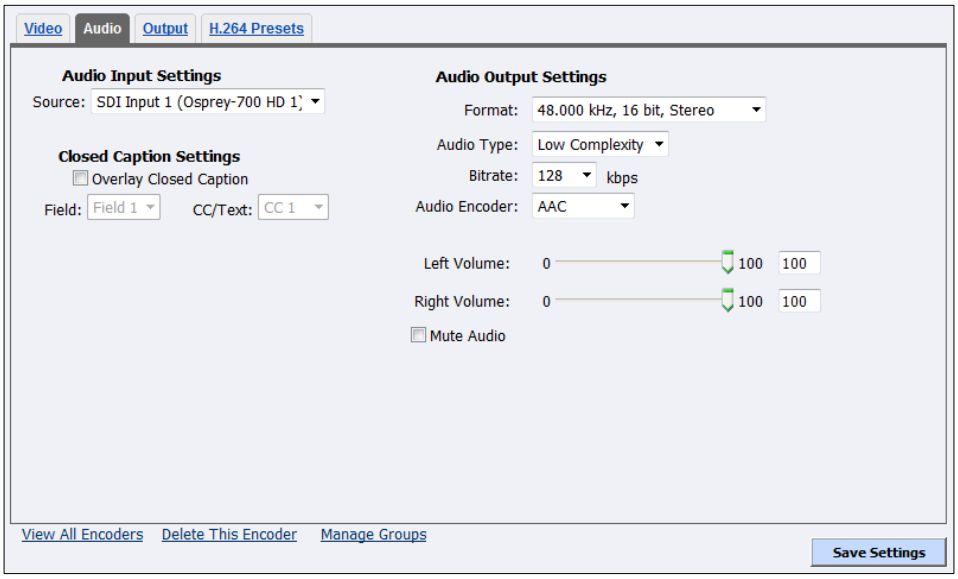



*Note: Telecine and inverse telecine only apply to NTSC video. They are not used for PAL and SECAM video. The system disables **Bob0** and **Bob1** choices when you select either **PAL** or **SECAM** as the video standard.*

8. Click **Save Settings**.

# Audio tab

**Figure 89. Audio tab**




**To configure audio settings:**

1. In the **Source** field, select an audio source from the drop-down list.

   *IMPORTANT! The audio input must match the source connected on the back of the Niagara 4100 and your audio source.*

2. Select the **Overlay Closed Caption** check box to enable overlay closed captions. Field 1 CC1 is the default setting.
3. Click the audio **Format** from the drop-down list.
4. Select the **Audio Type** from the drop-down list:
   - Main – The same as Low Complexity, but adds backward prediction.
   - Low Complexity – The simplest and most widely used AAC audio format type.
   - HE-AAC V1 – Uses spectral band replications (SBR) to enhance the compression efficiency in the frequency domain.
   - HE-AAC V2 – Enhances the compression efficiency of stereo signals.

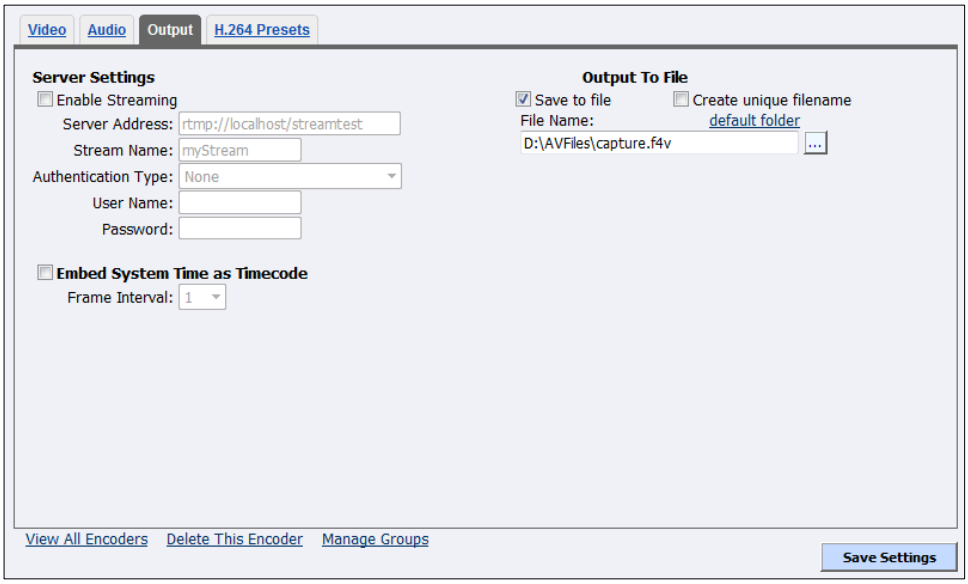
   *Note: Depending on the player on which the resulting stream will be rendered, either choice will use a specific set of tools to encode the audio stream. Make your choice based on the requirement of the playback software or device. The most widely supported format is the Low Complexity profile.*

5. Click the **Bitrate** from the drop-down list.
6. Click the **Audio Encoder** from the drop-down list.
7. Drag the sliders to adjust the **Left Volume** and **Right Volume**.
8. (Optional) Select **Mute Audio** silence the audio.
9. Click **Save Settings**.

# Output tab

You need Adobe Flash Media Server 3.5 or greater to stream Flash H.264.

**Figure 90. Output tab**



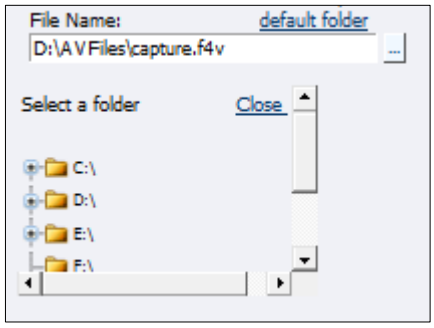

**To configure output settings:**

1. Select **Enable Streaming** to enable live Flash streaming.
2. Enter the proper IP address or domain name in the **Server Address** field.
3. Enter the **Stream Name**.
4. Select the **Authentication Type** from the drop-down list.
5. Enter the **User Name** and **Password**.
6. Select **Embed System Time as Timecode**.
7. Click the **Frame Interval** from the drop-down list.
8. Select **Save to File** to save the encoded content to a file. Each time you start this encoder, the system overwrites the previous file.

   *Note: You must enable either **Enable Streaming** or **Save to File**. If both **Enable Streaming** and **Save to File** are disabled, the encoder will not start and an error is generated.*
9. Select **Create unique file** to create a file that the system does not overwrite.
10. Accept the default location that displays in the **File Name** field or choose your own location for the file. To choose your own personal location select the link (horizontal ellipses or … ) to the right of the File Name field and display the options (Figure 91).

    *Note: By default, the system sets this folder to D:\AVFiles\ with a default filename of capture.f4v.*

**Figure 91. Save to File Location**




*WARNING! You can only save media files to drive D. Check drive properties for available free space to determine your storage capacity.*

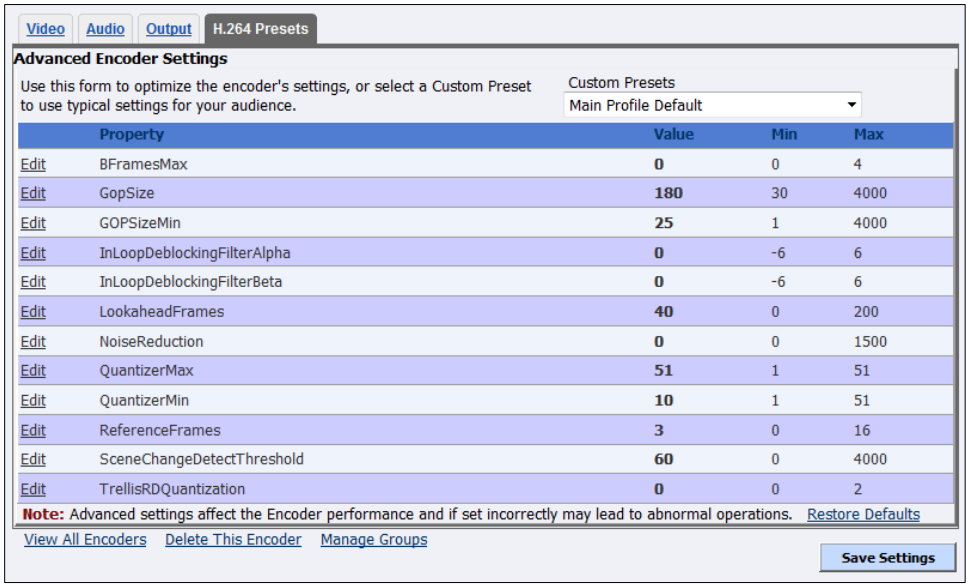
*A better practice would be to use the Flash Media server to save a file or to save it to a remote drive. If you inadvertently fill all available space, you risk losing your stream during a streaming event.*

11. Click **Save Settings**.

# H.264 Presets tab

You can edit specific H.264 encoder settings or you can select a custom preset to use typical settings for your profile. These advanced settings affect the way the Encoder performs and if set incorrectly may lead to abnormal encoder operations (Figure 92). Refer to *Appendix B* for suggested values for the type of video you are streaming and a complete list of typical settings.

**Figure 92. H.264 Presets tab**


Video
Audio
Output
H.264 Presets
Advanced Encoder Settings
Use this form to optimize the encoder's settings, or select a Custom Preset to use typical settings for your audience.
Custom Presets
Main Profile Default
Property
Value
Min
Max
Edit BFramesMax 0 0 4
Edit GopSize 180 30 4000
Edit GOPSizeMin 25 1 4000
Edit InLoopDeblockingFilterAlpha 0 -6 6
Edit InLoopDeblockingFilterBeta 0 -6 6
Edit LookaheadFrames 40 0 200
Edit NoiseReduction 0 0 1500
Edit QuantizerMax 51 1 51
Edit QuantizerMin 10 1 51
Edit ReferenceFrames 3 0 16
Edit SceneChangeDetectThreshold 60 0 4000
Edit TrellisRDQuantization 0 0 2
Note: Advanced settings affect the Encoder performance and if set incorrectly may lead to abnormal operations. Restore Defaults
View All Encoders
Delete This Encoder
Manage Groups
Save Settings

**To configure H.264 settings:**

1. Click **Edit** next to the setting you want to modify.

   *IMPORTANT! These advanced settings affect the way the Encoder performs and if set incorrectly may lead to abnormal encoder operations. Refer to* Appendix B: H.264 Advanced Settings *for suggested values for the type of video you are streaming.*

2. Change the value.
3. Click **Update**.
4. Click the **Restore Defaults** link at the bottom of the window to return the settings to the defaults.

   *Note: The database has seven profiles. Clicking* ***Restore Defaults*** *for one profile will change all profiles back to the default settings.*

5. Click **Save Settings**.

# Editing an MPEG-4 encoder

To create an encoder, **Encoders ➢ All Encoders ➢ Create New Encoder** link ➢ **Encoder Name** field.

When you create a new encoder, the Encoder Properties window appears. The Encoder Properties windows for editing a new encoder or an existing encoder are identical. You must configure the audio and video settings for each encoder type.

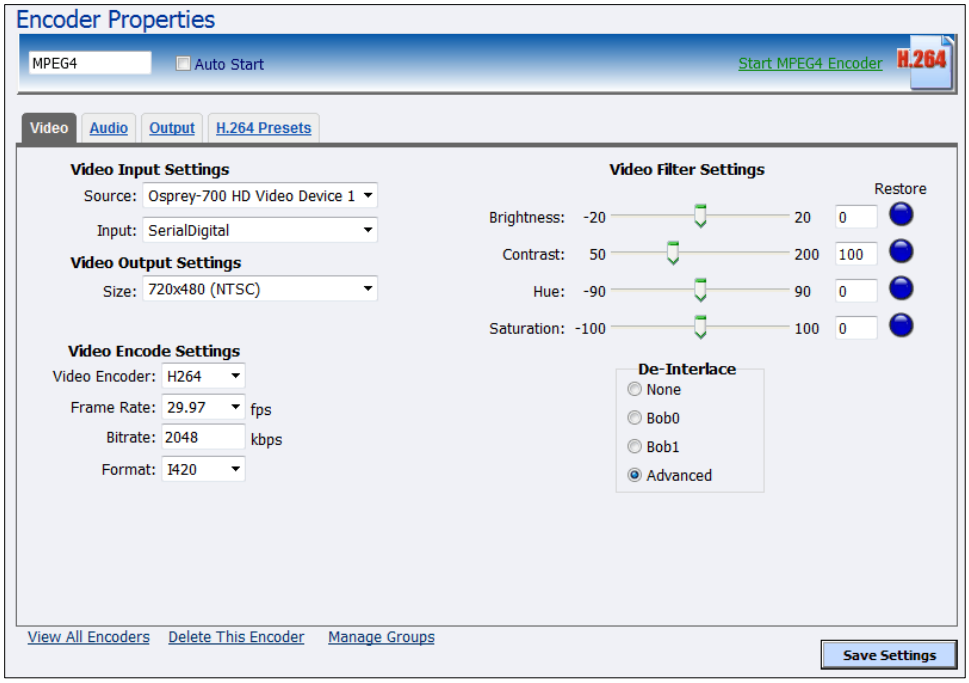
Use the Video, Audio, Output, and H.264 Presets tabs to edit the settings. Begin with configuring the video and audio settings, then the streaming properties. The streaming properties and advanced streaming settings are different for each type of encoder.

From the MPEG Encoder Properties window (Figure 93), you can set the encoder to start streaming automatically by selecting the **Auto Start** check box. You can also start the encoder from this window by clicking the **Start MPEG4 Encoder Driver** link in the top right corner of the window.

Click **Encoders ➢ All Encoders** from the home page. Then select the **Edit** link next to the MPEG encoder whose properties you wish to modify. The system displays the Encoder Properties window for the selected encoder.

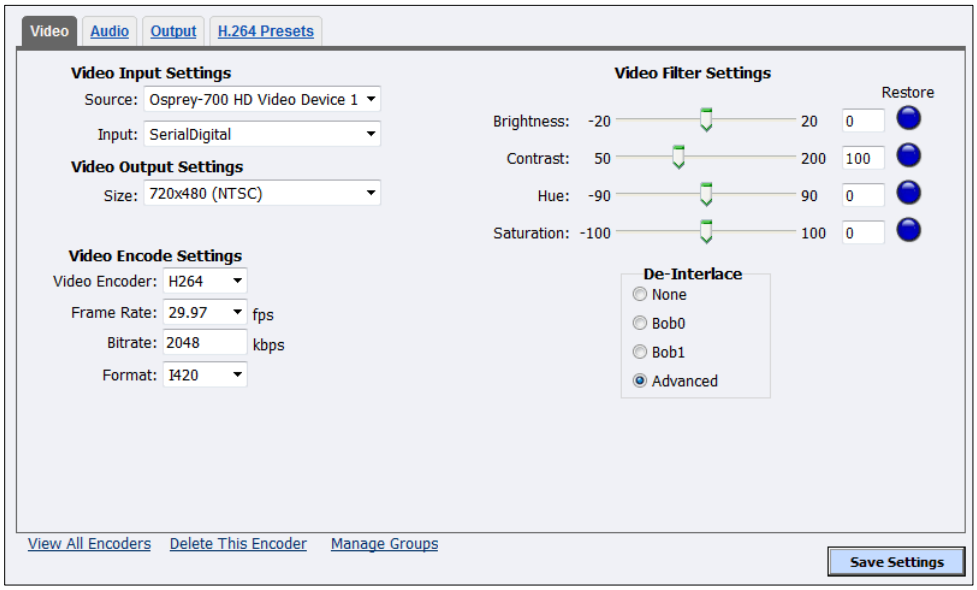
*IMPORTANT! If you make any changes to the Encoder Properties window, you must click **Save Settings**. Otherwise, all your changes will be lost.*

**Figure 93. MPEG4 Encoder Properties**



# Video tab

**Figure 94. Video tab**




**To configure video settings:**

1. In the **Source** field, click a device from the drop-down list:
   - Osprey-700 HD Video Device 1
   - Disabled

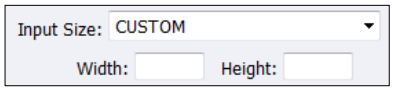
   *Note: Because the Niagara 4100 is a single-channel encoder, you can only connect and stream one audio and video source at any given time. However, you can stream the same audio and video at multiple data rates and multiple formats to provide the best user experience for different viewing audiences.*

2. In the **Input** field, the video input is **SerialDigital**.

3. In the **Size** field, select the pixel size of the encoded video from the pre-determined sizes in the drop-down list.
   You can also specify a custom size for your video. This customization is useful when you are capturing video to be played on a mobile video-device that requires a non-standard size for compatibility.
   When you click **Custom**, two additional fields appear so you can enter the exact size you want the resulting video to be (Figure 95).

   *Note: The size in the Width and Height field must be divisible by 2.*

   **Figure 95. Custom fields**

   *Note: CIF and QCIF are proportional to the HD video resolution input.*

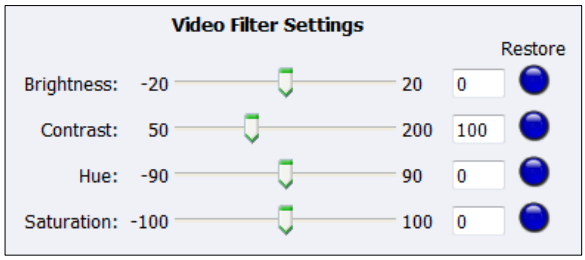
4. Click the type of **Video Encoder** for Internet video, mobile phones set top boxes, and create

media files for other MPEG-4 compatible devices such as iPods according to the following Motion Picture Expert Group (MPEG) types (refer to Table 1 and Table 2).

*IMPORTANT! Choose the container type (MP4, 3G2, and 3GP) on the Output tab.*

5. Enter the frames per second in the **Frame Rate** field.
6. Enter the kilobits per second in the **Bitrate** field.
7. In the **Format** field, indicate the color space format.
8. Drag the sliders to adjust the **Brightness**, **Contrast**, **Hue**, and **Saturation** (Figure 96).

**Figure 96. Video Filter Settings**

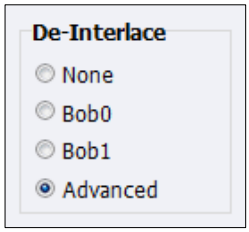



*Note: Click **Restore** to the right of the filter to reset the settings to the default.*

9. Click the **De-Interlace** setting you want to apply (Figure 97). Options include:

- **None**
  – Performs no de-interlacing of any kind.
- **Bob0**
  – Applies inverse telecine de-interlacing to all telecine video.
  – Applies motion adaptive de-interlacing to all video that is not telecine.
  – Switches dynamically between the two modes as the content changes.
  – Available for NTSC video only.
- **Bob1**
  – Drops the redundant fields and reassembles the video in a 24 fps progressive format.
  – Applies inverse telecine de-interlacing to all telecine video.
  – Performs no de-interlacing of video that is not telecine.
  –Available for NTSC video only.
- **Advanced**
  – Is an algorithm for de-interlacing pure video (non-telecine) content.
  – Applies motion adaptive interlacing to all video. It detects which portions of the image are still and which portions are in motion then applies different processing to each scenario.

**Figure 97. De-Interlace settings**



*Note: Telecine and inverse telecine only apply to NTSC video. They are not used for PAL and SECAM video. The system disables Bob0 and Bob1 choices when you select either PAL or SECAM as the video standard.*

10. Click **Save Settings**.

**Table 1. MPEG encoder and container descriptions**

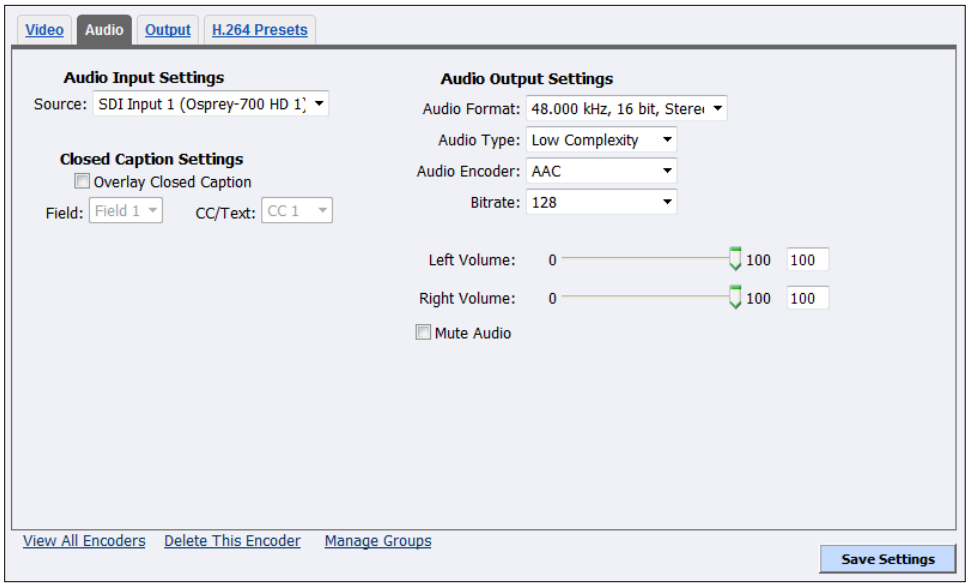
| | |
|---|---|
| **MPEG4 – MP4** | MPEG-4 Part 2 is for situations where low bit rate and low resolution are mandated by other conditions of the applications, such as network bandwidth or device size. Examples of video applications for MPEG-4 are cell phones, some low-end video conferencing systems, and surveillance systems. MPEG-4 is important for legacy handheld devices that do not support H.264. |
| **H264 – MP4** | H.264, MPEG-4 Part 10, or AVC (Advanced Video Coding) was designed for high data compression while maintaining better quality than its predecessor, H.263. It also addresses a broad range of applications from low bit rate to high bit rate and from low resolution such as cell phones to high resolution such as broadcast.<br>Niagara SCX's H.264 presets are Baseline, Main and High Profiles. |
| **MPEG-TS** | MPEG transport stream is a standard format for transmission and storage of audio, video, and Program and System Information Protocol (PSIP) data. It is used in broadcast systems such as DVB, ATSC and IPTV. |
| **H.264-TS** | H.264 encoding provided a MPEG-2 transport stream (TS) container. |
| The Third Generation Partnership Project (3GPP) defined 3GP as a multimedia container format for use on 3G mobile phones. It stores video streams such as MPEG-4 or H.264 and audio streams such as AAC.<br>This format has two defined standards:<br>● 3GPP for GSM-based mobile phones<br>● 3GPP2 for CDMA-based mobile phones<br>This setting creates an H.263 stream stored in a 3GPP container. | |
| **H264 – 3GP** | This setting creates an H.264 stream stored in a 3GP container. |
| **H264 – 3G2** | This setting creates an H.264 stream stored in a 3G2 container. |
| **MPEG4 – 3GP** | This setting creates an MPEG-4 stream stored in a 3GP container. |
| **MPEG4 – 3G2** | This setting creates an MPEG-4 stream stored in a 3G2 container. |
| **H263 – 3GP** | This setting creates an H.263 stream stored in a 3GP container. |
| **H263 – 3G2** | This setting creates an H.263 stream stored in a 3G2 container. |

**Table 2. Valid output container selections for video encoder types**

| Container | H.263 Video | MPEG-4 Video | H.264 Video | MPEG-2 |
|---|---|---|---|---|
| MP4 | N/A | ✓ | ✓ | |
| 3GP | ✓ | ✓ | ✓ | |
| 3G2 | ✓ | ✓ | ✓ | |
| TS | | | ✓ | ✓ |

# Audio tab

**Figure 98. Audio tab**




**To configure audio settings:**

1. In the **Source** field, select an audio source from the drop-down list.

   *IMPORTANT! The audio input must match the connectors on the back of the Niagara 4100 and your audio source.*

2. Click the **Audio Type** from the drop-down list:

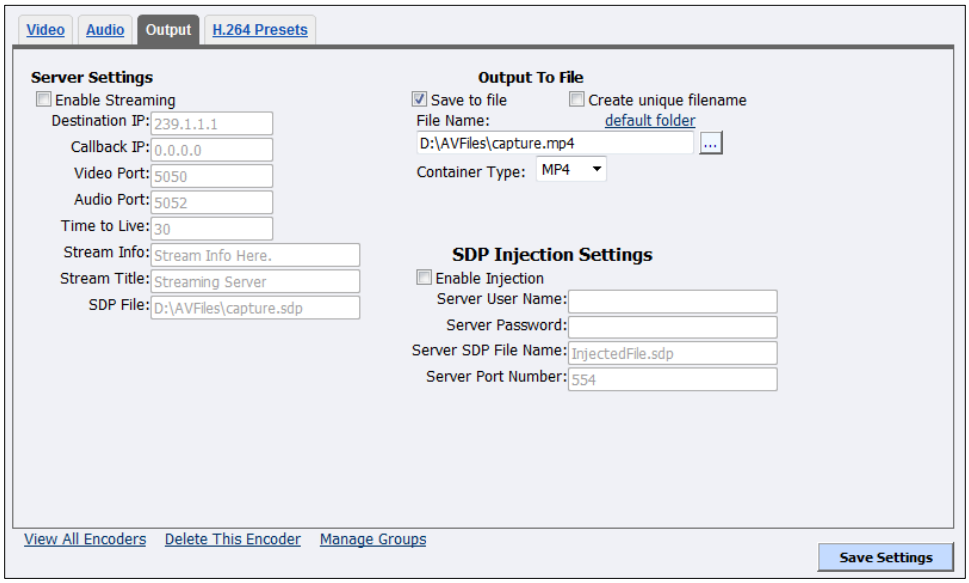
   - **Main** – The same as Low Complexity, but adds backward prediction.
   - **Low Complexity** – The simplest and most widely used AAC audio format type.
   - **HE-AAC V1** – Uses spectral band replication (SBR) to enhance the compression efficiency in the frequency domain.
   - **HE-AAC V2** – Enhances the compression efficiency of stereo signals.

   *Note: Depending on the player on which the resulting stream will be rendered, either choice will use a specific set of tools to encode the audio stream. Make your choice based on the requirement of the playback software or device. The most widely supported format is the Low Complexity profile.*

3. The default **Audio Encoder** is AAC (Advanced Audio Coding) a standardized, lossy compression and encoding scheme for digital audio. AAC achieves better audio quality than MP3. AAC and MP3 are MPEG standards.
4. Click the **Bitrate** from the drop-down menu.
5. Drag the sliders to adjust the **Left Volume** and **Right Volume**.
6. Select **Mute Audio** to silence audio.
7. Click **Save Settings**.

# Output tab

**Figure 99. Output tab**




**To configure output settings:**

1. Click the **Enable Streaming** check box to stream your audiovisual content via RTSP.
2. Set the appropriate streaming properties.

   *Note: The default settings will enable multicast streaming. If you do not want this, change the IP address for Group to the IP address of the server to which you want to stream from the encoder.*

3. In the **SDP File** field, enter a name and a destination path for the resulting SDP file created when you start the stream. If you are streaming to Helix, a QuickTime, or a Darwin server, refer to its respective documentation or online message boards for setup details specific for the individual streaming server.

   *Note: You can stream point-to-point by selecting a share destination directory for the saved SDP file. Remember to disable multicasting by entering in the IP address of the PC to which you want to stream.*

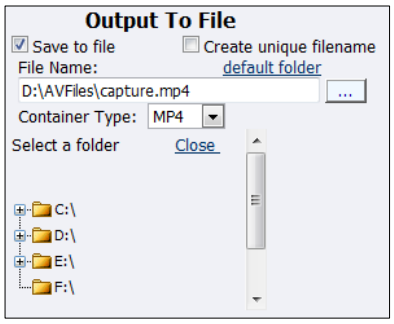
   *For example, if you want another PC to view the stream, save the SDP file to a share folder on the local drive. The other PC can open the SDP file and the stream can be played in a QuickTime or other MPEG-4 compatible streaming player. Since MPEG-4 encoding can be CPU intensive, it is not recommended that you view the stream on the Niagara encoder. Doing so may overtax the host CPU, which will cause video quality degradation and encode session failure.*

4. Select **Save to File** to save the encoded content to a file. Each time you start this encoder, the system overwrites the previous file.
5. Select **Create unique file** to create a file that the system does not overwrite.
6. Accept the default location that displays in the **File Name** field or choose your own location for the file. To choose your own personal location select the link (horizontal ellipses or … ) to

the right of the **File Name** field and display the options (Figure 100).

*Note: By default, the system sets this folder to D:\AVFiles\ with a default file name of capture.mp4. See* Exporting captured video files *for instructions on saving video files to a USB device.*

**Figure 100. Select a folder**



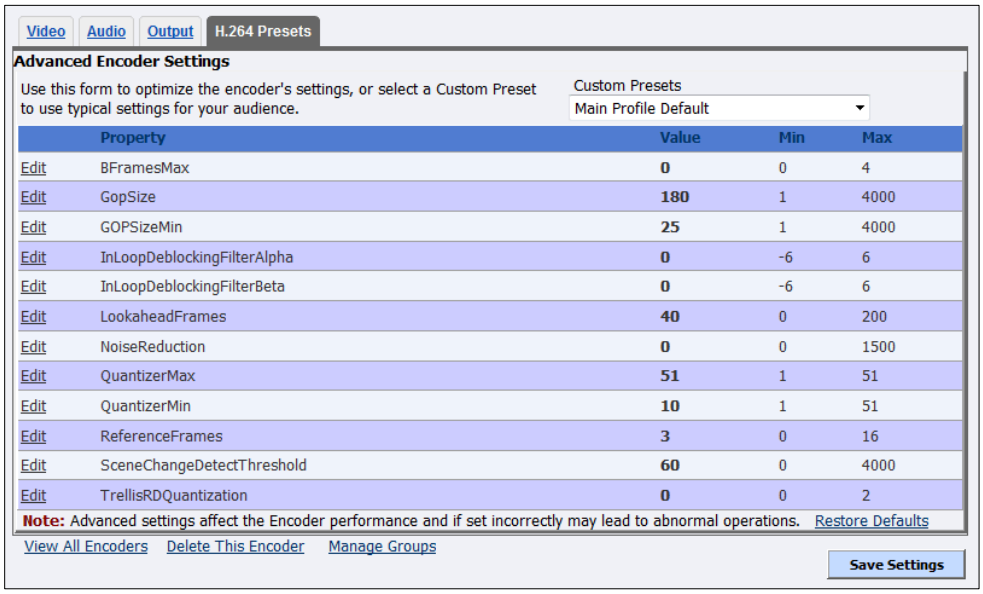

*WARNING! You can only save media files to drive D. Check drive properties for available free space to determine your storage capacity.*

*A better practice would be to use a streaming server to save a file or to save it to a remote drive. If you inadvertently fill all available space, you risk losing your stream during a streaming event.*

7. Select the **Container Type** (see Table 2).
8. Click the **Enable Injection** checkbox to inject an SDP file onto your server.
9. Set the appropriate setting for the server.
10. Enter the username and password.
11. Enter the **Server SDP File Name**.
12. Enter the **Server Port Number**.
13. Click **Save Settings**.

# H.264 Presets tab

**Figure 101. H.264 Settings tab**


Video
Audio
Output
H.264 Presets
Advanced Encoder Settings
Use this form to optimize the encoder's settings, or select a Custom Preset to use typical settings for your audience.
Custom Presets
Main Profile Default
Property
Value
Min
Max
Edit BFramesMax 0 0 4
Edit GopSize 180 1 4000
Edit GOPSizeMin 25 1 4000
Edit InLoopDeblockingFilterAlpha 0 -6 6
Edit InLoopDeblockingFilterBeta 0 -6 6
Edit LookaheadFrames 40 0 200
Edit NoiseReduction 0 0 1500
Edit QuantizerMax 51 1 51
Edit QuantizerMin 10 1 51
Edit ReferenceFrames 3 0 16
Edit SceneChangeDetectThreshold 60 0 4000
Edit TrellisRDQuantization 0 0 2
Note: Advanced settings affect the Encoder performance and if set incorrectly may lead to abnormal operations.
Restore Defaults
View All Encoders
Delete This Encoder
Manage Groups
Save Settings

**To configure H.264 settings:**

1. Click **Edit** next to the setting you want to modify.

   *IMPORTANT! These advanced settings affect the way the encoder performs and if set incorrectly may lead to abnormal encoder operations. Refer to the H.264 Advanced Settings section in Appendix B for suggested values for the type of video you are streaming.*

2. Change the **Value**.

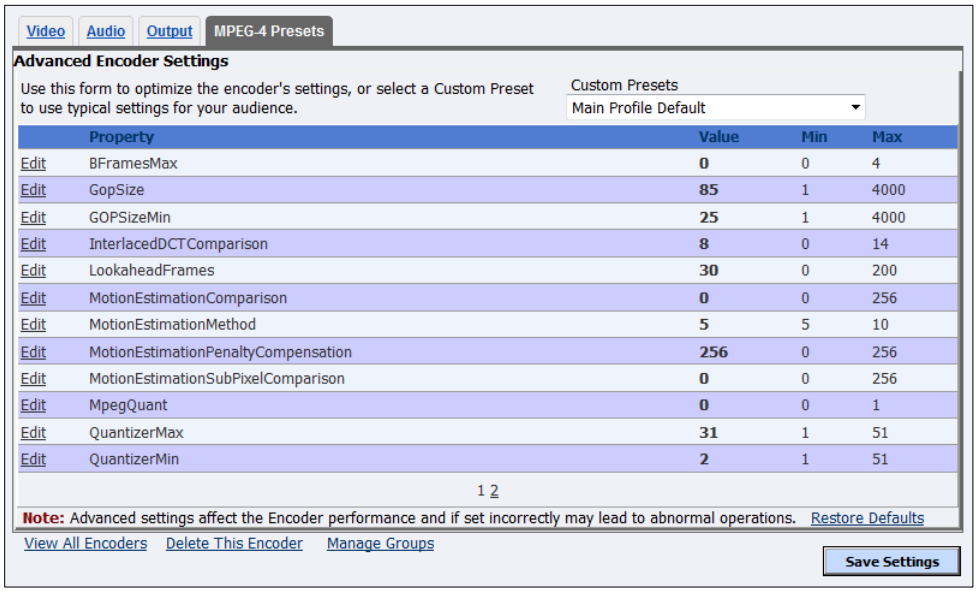
3. Click **Update**.

4. Click the **Restore Defaults** link at the bottom of the window to return the settings to the defaults.

   *Note: The database has seven custom presets. Clicking **Restore Defaults** for one profile will change all profiles back to the default settings.*

# MPEG4 Presets tab

**Figure 102. MPEG4 Settings tab**


Video
Audio
Output
MPEG-4 Presets
Advanced Encoder Settings
Use this form to optimize the encoder's settings, or select a Custom Preset to use typical settings for your audience.
Custom Presets
Main Profile Default
Property
Value
Min
Max
Edit BFramesMax 0 0 4
Edit GopSize 85 1 4000
Edit GOPSizeMin 25 1 4000
Edit InterlacedDCTComparison 8 0 14
Edit LookaheadFrames 30 0 200
Edit MotionEstimationComparison 0 0 256
Edit MotionEstimationMethod 5 5 10
Edit MotionEstimationPenaltyCompensation 256 0 256
Edit MotionEstimationSubPixelComparison 0 0 256
Edit MpegQuant 0 0 1
Edit QuantizerMax 31 1 51
Edit QuantizerMin 2 1 51
1 2
Note: Advanced settings affect the Encoder performance and if set incorrectly may lead to abnormal operations. Restore Defaults
View All Encoders
Delete This Encoder
Manage Groups
Save Settings

**To configure MPEG4 settings:**

1. Click **Edit** next to the setting you want to modify.

   *IMPORTANT! These advanced settings affect the way the encoder performs and if set incorrectly may lead to abnormal encoder operations. Refer to the H.264 Advanced Settings section in Appendix B for suggested values for the type of video you are streaming.*

2. Change the **Value**.

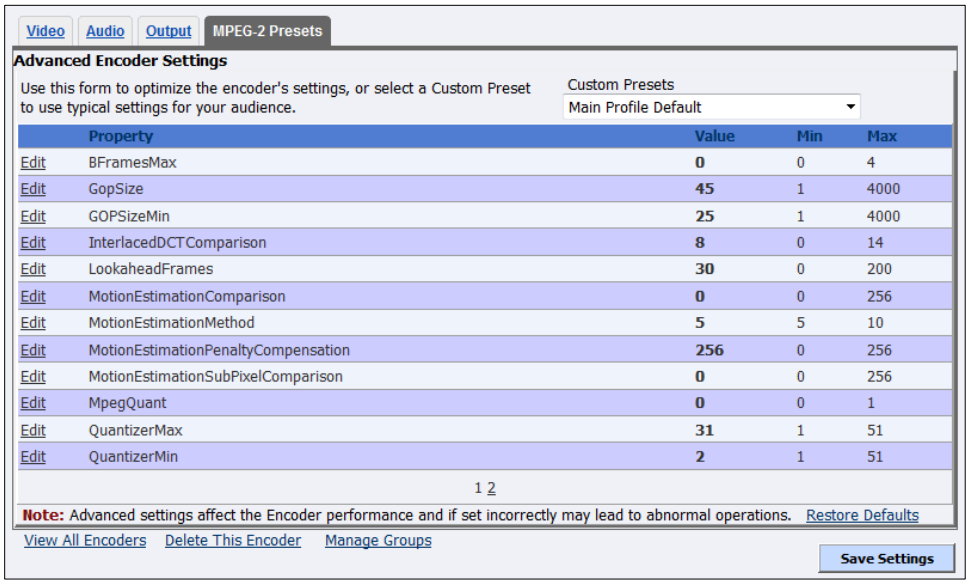
3. Click **Update**.

4. Click the **Restore Defaults** link at the bottom of the window to return the settings to the defaults.

   *Note: The database has seven custom presets. Clicking **Restore Defaults** for one profile will change all profiles back to the default settings.*

# MPEG2 Presets tab

**Figure 103. MPEG2 Settings tab**


Video
Audio
Output
MPEG-2 Presets
Advanced Encoder Settings
Use this form to optimize the encoder's settings, or select a Custom Preset to use typical settings for your audience.
Custom Presets
Main Profile Default
Property
Value
Min
Max
Edit BFramesMax 0 0 4
Edit GopSize 45 1 4000
Edit GOPSizeMin 25 1 4000
Edit InterlacedDCTComparison 8 0 14
Edit LookaheadFrames 30 0 200
Edit MotionEstimationComparison 0 0 256
Edit MotionEstimationMethod 5 5 10
Edit MotionEstimationPenaltyCompensation 256 0 256
Edit MotionEstimationSubPixelComparison 0 0 256
Edit MpegQuant 0 0 1
Edit QuantizerMax 31 1 51
Edit QuantizerMin 2 1 51
1 2
Note: Advanced settings affect the Encoder performance and if set incorrectly may lead to abnormal operations. Restore Defaults
View All Encoders
Delete This Encoder
Manage Groups
Save Settings

**To configure MPEG2 settings:**

1. Click **Edit** next to the setting you want to modify.

   *IMPORTANT! These advanced settings affect the way the encoder performs and if set incorrectly may lead to abnormal encoder operations. Refer to the H.264 Advanced Settings section in Appendix B for suggested values for the type of video you are streaming.*

2. Change the **Value**.

3. Click **Update**.

4. Click the **Restore Defaults** link at the bottom of the window to return the settings to the defaults.

   *Note: The database has seven custom presets. Clicking **Restore Defaults** for one profile will change all profiles back to the default settings.*

# Editing a Windows Media encoder

To create an encoder, **Encoders ➢ All Encoders ➢ Create New Encoder** link ➢ **Encoder Name** field.

When you create a new encoder, the Encoder Properties window appears. The Encoder Properties windows for editing a new encoder or an existing encoder are identical. You must configure the video and audio settings for each encoder type.

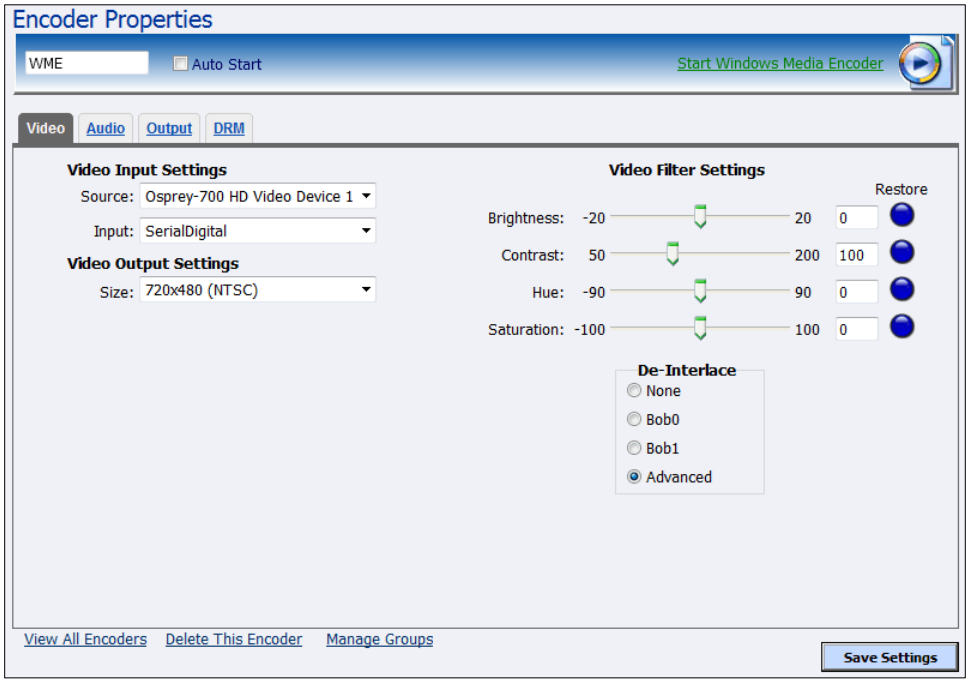
Use the Video, Audio, Output, and DRM tabs to edit the settings. Begin with configuring the video and audio settings then the server settings. The server settings are different for each type of encoder.

From the Windows Media Encoder Properties window (Figure 104), you can set the encoder to start streaming automatically by selecting **Auto Start**. You can also start this encoder from this window by clicking the **Start Windows Media Encoder** link at the top right corner of the window.

Click **Encoders ➢ All Encoders** from the home page. Then select the **Edit** link next to the Windows Media encoder whose properties you wish to modify. The system displays the Encoder Properties window for the selected encoder.

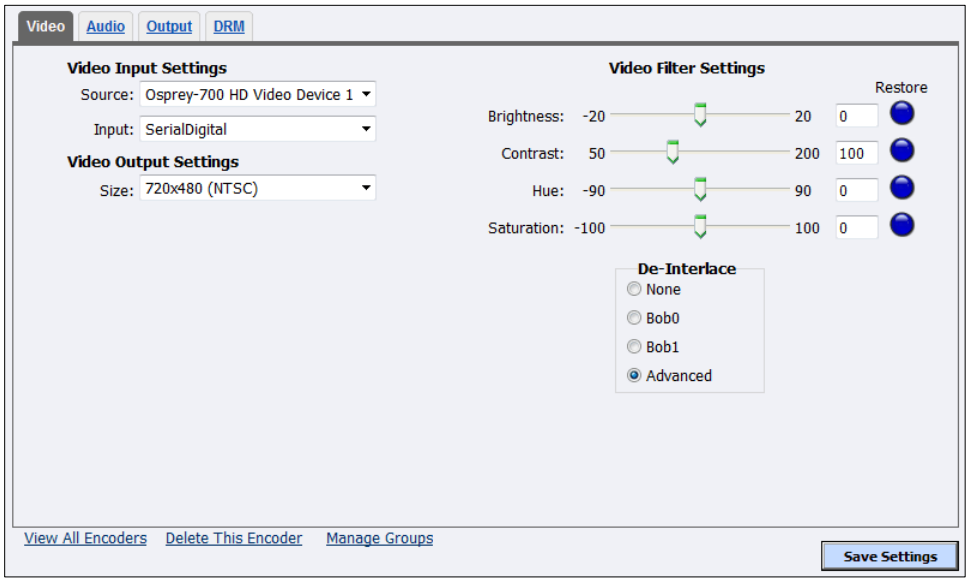
*IMPORTANT! If you make any changes to the Encoder Properties window, you must click **Save Settings**. Otherwise, all your changes will be lost.*

**Figure 104. Windows Media encoder properties**



# Video tab

**Figure 105. Video tab**




**To configure video settings:**

1. Select the video input **Source** from the drop-down list.
2. In the **Size** field, click the pre-determined size of the encoded video from the drop-down list:
   You can also specify a custom size for your video. The customization is useful when you are capturing video to be played on a mobile video-device that requires a non-standard size for compatibility.
   When you click **Custom**, two additional fields appear so you can enter the exact size you want the resulting video to be (Figure 106).

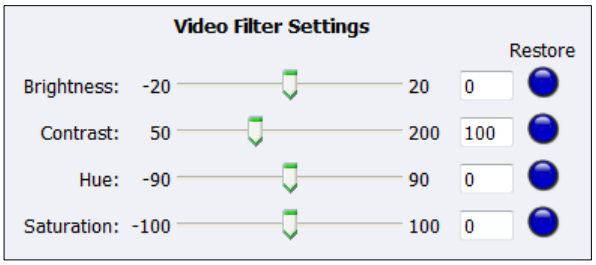
   *Note: The size in the Width and Height fields must be divisible by 2.*

   **Figure 106. Custom fields**

   *WARNING! Ensure all of the encoders using the same video Proportion and Size settings also use the save Video and Audio Source settings.*
3. Drag the sliders to adjust the **Brightness**, **Contrast**, **Hue**, and **Saturation** (Figure 107).

   **Figure 107. Video filter settings**

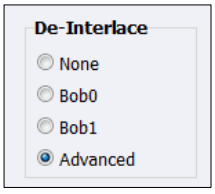



*Note: Click **Restore** to the right of each filter to return the setting to the default.*

4. Click the **De-Interlace** settings you want to apply (Figure 108). Options include:

   - **None**
     – Performs no de-interlacing of any kind.
   - **Bob0**
     – Applies inverse telecine de-interlacing to all telecine video.
     – Applies motion adaptive de-interlacing to all video that is not telecine.
     – Switches dynamically between the two modes as the content changes.
     – Available for NTSC video only.
   - **Bob1**
     – Drops the redundant fields and reassembles the video in a 24 fps progressive format.
     – Applies inverse telecine de-interlacing to all telecine video.
     – Performs no de-interlacing of video that is not telecine.
     –Available for NTSC video only.
   - **Advanced**
     – Is an algorithm for de-interlacing pure video (non-telecine) content.
     – Applies motion adaptive interlacing to all video. It detects which portions of the image are still and which portions are in motion then applies different processing to each scenario.

**Figure 108. De-Interlace Settings**

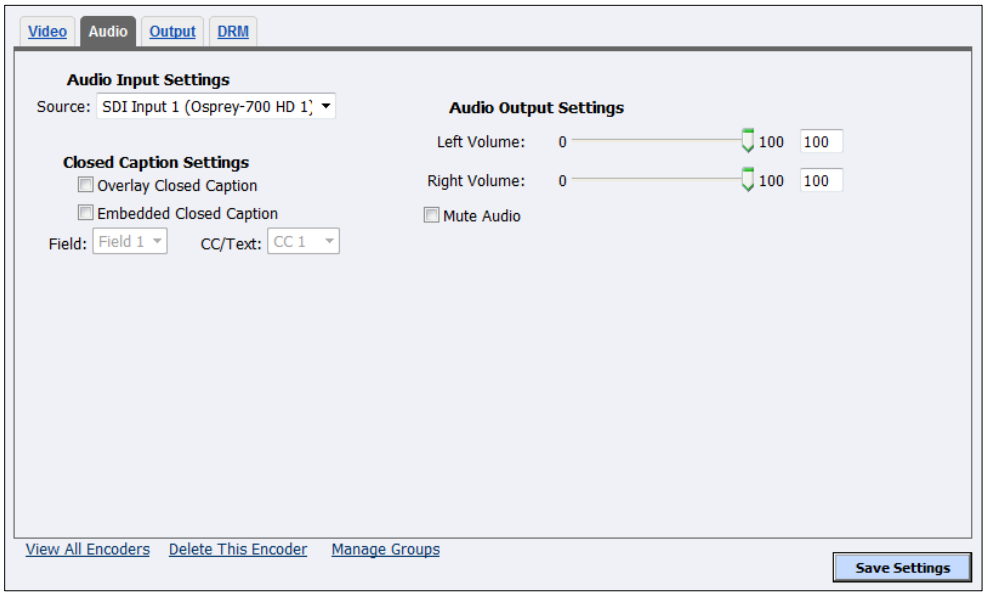



*Note: Telecine and inverse telecine only apply to NTSC video. They are not used for PAL and SECAM video. The system disables Bob0 and Bob1 choices when you select either PAL or SECAM as the video standard.*

5. Click **Save Settings**.

# Audio tab

**Figure 109. Audio tab**




**To configure audio settings:**

1. In the **Source** field, select an audio source from the drop-down list.

   *IMPORTANT! The audio input must match the connectors on the back of the Niagara 4100 and your audio source.*

2. Select the **Overlay Closed Caption** check box to enable overlay closed captions.
3. Select the **Embedded Closed Caption** check box to embed the closed captions. Field 1 CC 1 is the default setting.
4. Drag the slider to adjust the **Left Volume** and **Right Volume**.
5. (Optional) Select **Mute Audio** to silence audio.
6. Click **Save Settings**.

# Output tab

Microsoft® Windows Media is both a storage format and a streaming format. In addition to the ability to output to a file, the Windows Media encoder can stream to a Windows Media Server. The settings for Windows Media encoder include the ability to set parameters for connecting and streaming to the server.

Some Windows Media Capture Profiles have pre-defined video resolutions and input selections. When you select a Windows Media Capture Profile, verify your current video and audio settings have not been modified. If they have been modified, simply change these settings back to their previous settings and click **Save Settings**.

When streaming audio and video, the two methods are pull and push.

## Pull method

In the pull method, the system begins to generate broadcast packets as soon as you start as soon as you start the encoding. However, it does not deliver the broadcast stream until Windows Media Server requests the stream. This method does not provide a secure connection to the server and should only be used if the encoder and server reside within the same network firewall.

To enable clients to pull the stream from the Niagara system, set up a session and begin broadcasting directly from the system. Clients (Windows Media servers or players) can connect to the stream at any time. You can use mms or http scheme with either the IP address of DNS host name. For example:

http://encoding_computer_name:port

## Push method

With the push method, the system maintains a secure connection to Windows Media Server. This connection allows it to pass a user name and password to authenticate access to the server.

http://IP_address:port/publishing point

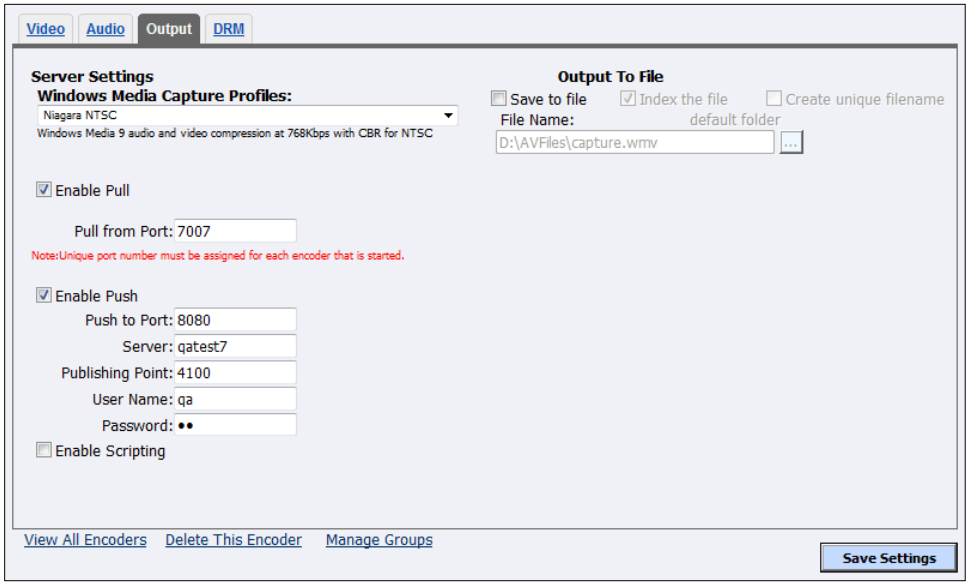
By default, the system supports up to 50 direct connections during a broadcast, but if you're sending to a lot of clients push to Windows Media Server. Use the pull method for testing. Use the push method for a wide distribution.

*Note: The more direct connections to the system, the more system resources are required. ViewCast does not recommend directly connecting players to the system. Streaming servers should connect to the system and, in turn, players should connect to the servers.*

Use the following table to configure the output analog input settings for a Windows Media encoder.

*Note: The choices in the drop-down list may vary.*

**Figure 110. Output tab**

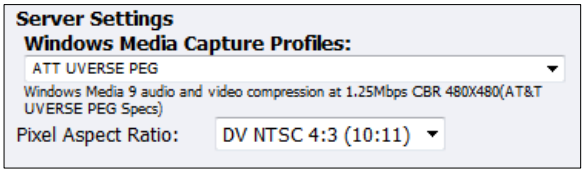



**To configure output settings:**

1. Click on a **Windows Media Capture Profile** from the drop-down list.

   *Note: When you select **ATT UVERSE PEG** from the drop-down list, the **Pixel Aspect Ratio** field displays (Figure 111). Select the **Pixel Aspect Ratio** from the drop-down list.*

   **Figure 111. Pixel Aspect Ratio field**

   
   Server Settings
Windows Media Capture Profiles:
ATT UVERSE PEG
Windows Media 9 audio and video compression at 1.25Mbps CBR 480X480(AT&T UVERSE PEG Specs)
Pixel Aspect Ratio:
DV NTSC 4:3 (10:11)

2. Select **Enable Pull**.
3. Enter a port number that the server will use to pull the stream from Niagara 4100.
4. Select **Enable Push**.

   *IMPORTANT! Be sure to enter a port number not already assigned to another encoder. If two encoders attempt to use the same port number, one or both encoders will fail to start.*

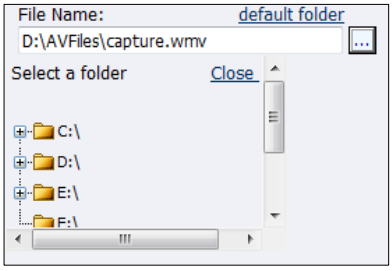
5. Enter a port number that the server will use to push the stream.
6. Enter the **Server** name or IP address.
7. Enter the **Publishing Point**.
8. Enter the **User Name**.
9. Enter the **Password**.
10. Select **Enable Scripting** to embed closed captions.

    *Note: If you enable closed captions through the Osprey driver, you cannot enable scripting.*

11. You can either:
    - Select **Save to File** to save the encoded content to a file. Each time you start this encoder, the system overwrites the previous file.
    - Select **Index the file** to drag the slider to any point in your video capture.
    - Select **Create unique file** to create a file that the system does not overwrite.
12. Accept the default location that displays in the **File Name** field or choose your own location for the file. To choose your own personal location select the link (horizontal ellipses or … ) to the right of the **File Name** field and display the options (Figure 112).

    *Note: By default, the system sets this folder to D:\AVFiles\ with a default file name of capture.wmv. See* Exporting captured video files *for instructions on saving video files to a USB device.*

**Figure 112. Select a folder**




*WARNING! You can only save media files to drive D. Check drive properties for available free space to determine your storage capacity.*

*A better practice would be to use the streaming server to save a file or to save it to a remote drive. If you inadvertently fill all available space, you risk losing your stream during a streaming event.*

13. Click **Save Settings**.

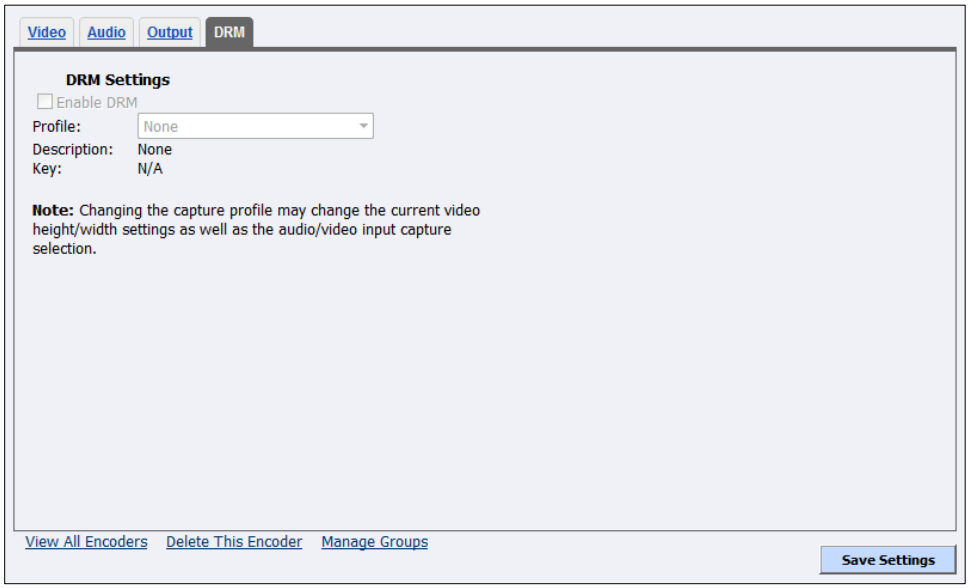
    *Note: If you click to another window before you click* ***Save Settings****, your changes will be lost.*

# DRM tab

You can protect your content using a technology called Digital Rights Management (DRM). Niagara SCX allows you to encrypt your content with DRM technology while you are encoding. You can apply DRM while encoding to a file and when broadcasting a stream. Users are required to obtain a license to play to content. This license contains the key to unlock the content and the rights that govern its use (Figure 113).

Refer to *Appendix A* on how to set up and import a DRM profile.

**Figure 113. DRM tab**




**To configure DRM settings:**

1. Select **Enable DRM**.
2. Click the DRM **Profile** you wish to apply from the drop-down list.

   *Note: When you enable DRM, Niagara SCX automatically changes the Windows Media Capture Profile setting to a DRM-compatible Windows Media 9 setting. You may need to adjust this setting after you enable DRM.*

3. Click **Save Settings**.

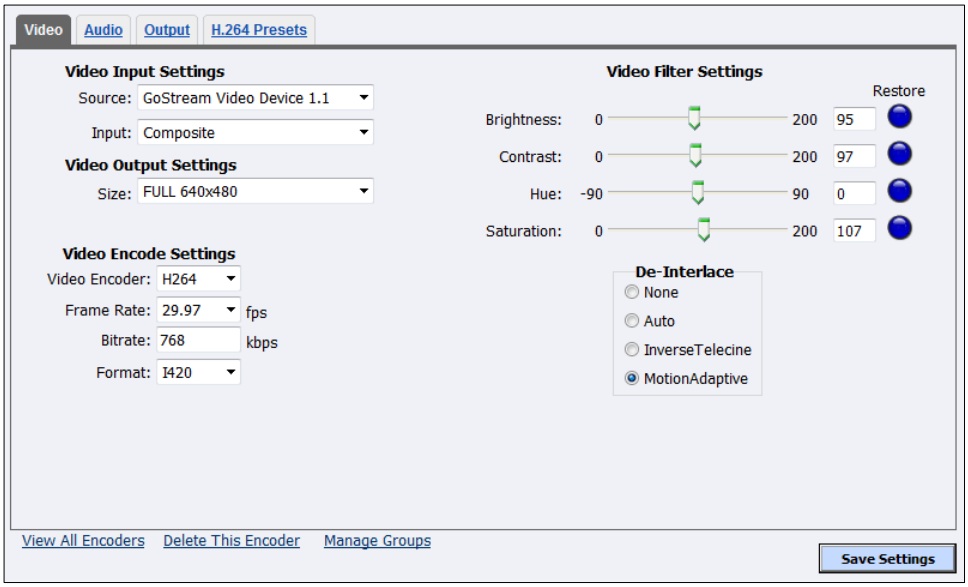
# TS Container

You can configure an MPEG encoder to stream to a TS container. To create an encoder, **Encoder ➢ All Encoders ➢ Create New Encoder** link ➢ **Encoder Name** field. You can also modify an existing MPEG encoder.

*Note: The **Type** on the Encoders page (**Encoders ➢ All Encoders**) displays as 264.*

## Streaming to a TS container

**Figure 114. MPEG4 encoder**



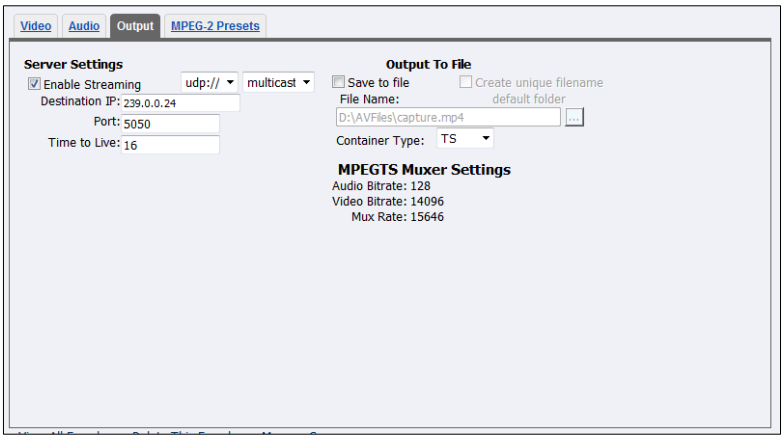

**To configure TS container settings:**

1. In the **Video Encoder** field on the Video tab, select either **MPEG2** or **H264**.

   *Note: H.264 and MPEG2 are the only currently accepted video encoder types that will output with the TS container.*

2. On the Output tab, Select **TS** as the Container Type.

**Figure 115. MPEG4 Output tab**

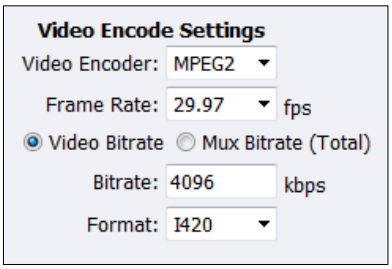



3. Click on the Video tab. Two additional fields display: **Video Bitrate** and **Mux Bitrate**.

4. Select either:

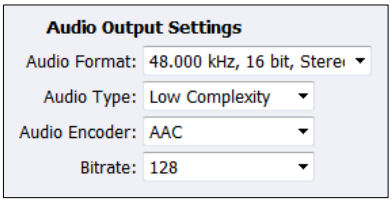
- **Video Bitrate** and enter how much bandwidth to use for the video in the Bitrate field.
- **Mux Bitrate** and enter the total bitrate the stream will consume (video and audio) in the **Bitrate** field on the Audio tab.

**Figure 116. New Video Encode Settings**




5. Click on the Audio tab.

**Figure 117. Audio Output Settings**

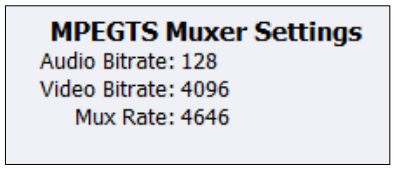



*Note: For MPEG2, the **Audio Type** field is disabled and MP2 is the only option in the **Audio Encoder** field.*

6. Select the **Format** from the drop-down list.

7. View all the bitrates on the Output tab in the MPEGTS Muxer Settings.

**Figure 118. MPEGTS Muxer Settings**



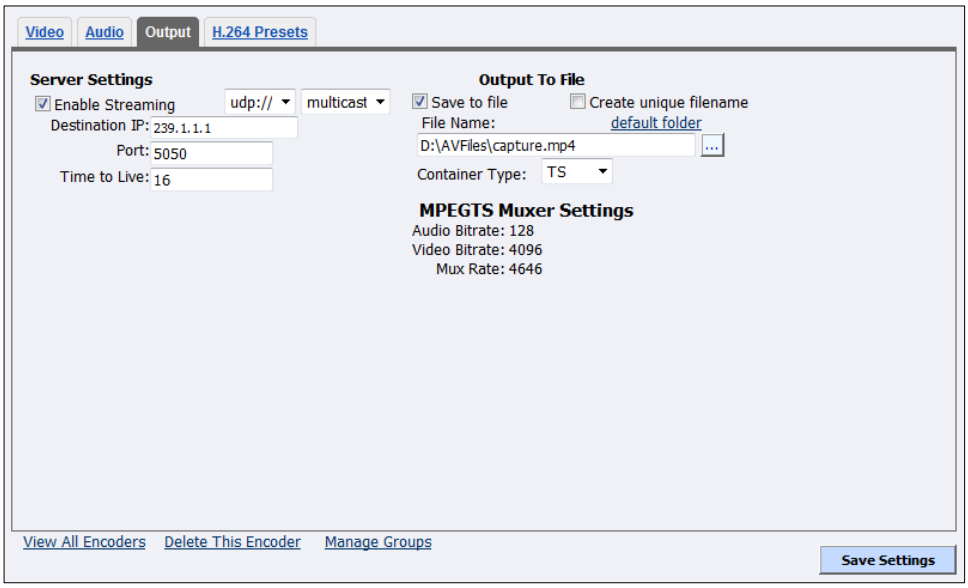

*Note: The total isn't simply Audio Bitrate + Video Bitrate. A small amount of overhead is built in ~10% of the Mux.*

# Streaming

Streaming to a file with the TS container is the same for the other containers. Streaming is slightly different.

## Output tab

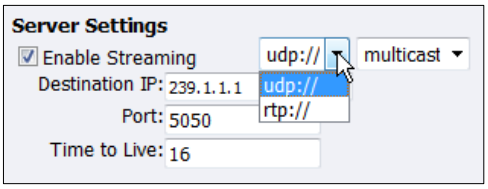
**Figure 119. Output tab ➢ Enable Streaming**




**To configure streaming:**

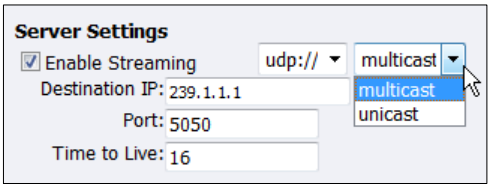
1. Select **Enable Streaming** on the Output tab.
2. Select the protocol. Currently only UDP and RTP are supported.

   **Figure 120. Server Settings ➢ Scheme**

3. Select either:
   - Unicast – To stream to a single computer or device.
   - Multicast – To stream to many computers and/or devices.

   **Figure 121. Server Settings**

4. Enter the **Destination IP** (must be an IPv4 address). If you select Unicast, then the IP address can *not* be in the 224.0.0.0 – 239.255.255 range. If you select Multicast, then the IP address *must* be in the 224.0.0.0 – 239.255.255.255 range.
5. Enter a valid **Port**.
6. Enter a **Time to Live**.
7. Click **Save Settings**.

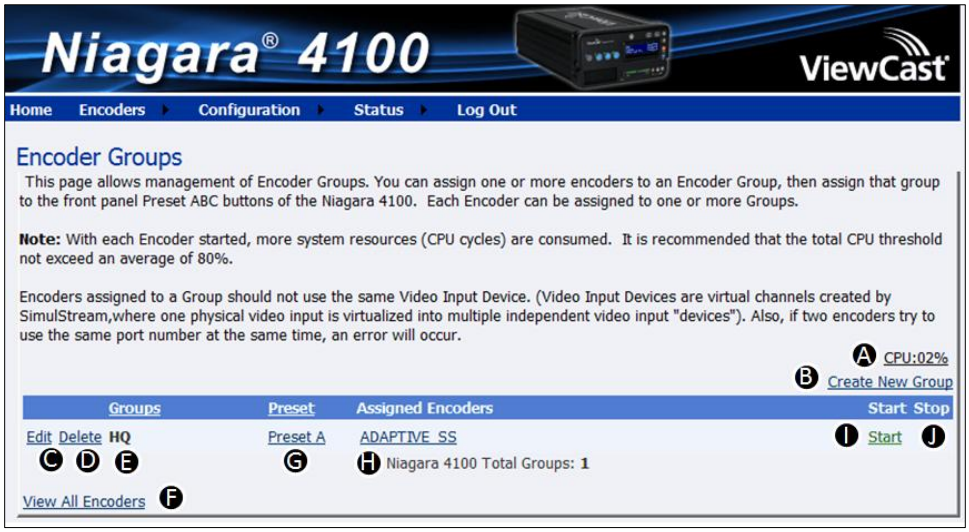
# Encoder Groups

Encoder groups represent the cornerstone for streaming on the Niagara 2200. You must have at least one group assigned on the Niagara 2200 and one encoder profile assigned to that group. The **Preset ABC** buttons on the system remain unusable until you have this minimum configuration.

## Viewing encoder groups

The **Encoder Groups** window (Figure 122), a subset of **Encoders** (on the Encoders window), allows you to view the list of encoder groups available for assignment to the Niagara 4100. Click **Encoders** ➢ **Groups** from the menu bar on the home page.

**Figure 122. Encoder Groups window**


Niagara® 4100
ViewCast
Home
Encoders
Configuration
Status
Log Out
Encoder Groups
This page allows management of Encoder Groups. You can assign one or more encoders to an Encoder Group, then assign that group to the front panel Preset ABC buttons of the Niagara 4100. Each Encoder can be assigned to one or more Groups.
Note: With each Encoder started, more system resources (CPU cycles) are consumed. It is recommended that the total CPU threshold not exceed an average of 80%.
Encoders assigned to a Group should not use the same Video Input Device. (Video Input Devices are virtual channels created by SimulStream,where one physical video input is virtualized into multiple independent video input "devices"). Also, if two encoders try to use the same port number at the same time, an error will occur.
A CPU:02%
B Create New Group
Groups
Preset
Assigned Encoders
Start Stop
Edit Delete HQ
C D E
Preset A
G
ADAPTIVE_SS
H Niagara 4100 Total Groups: 1
I Start
J
View All Encoders
F

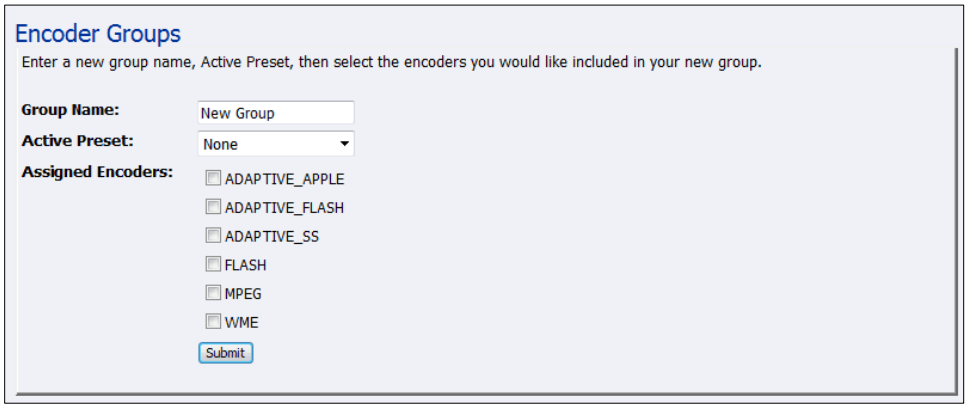
| | |
|---|---|
| **A** | Indicates the CPU usage. |
| **B** | Click this link to create a new group. |
| **C** | Click this link to edit a group. |
| **D** | Click this link to delete a group. |
| **E** | Displays the name of the group. |
| **F** | Click this link to display the Encoders window. |
| **G** | Displays which preset button is assigned to this group. Click this link to edit the preset. |
| **H** | Displays the encoders assigned to this group. Click the link for the encoder to display the Encoder Properties window for that encoder. |
| **I** | Click this link to start this group. |
| **J** | Click this link to stop this group. |

# Creating encoder groups

If two encoders try to use the same port number at the same time, an error will occur.

Select the **Create New Group** link on the **Encoder Groups** window. The encoder groups fields display (Figure 123).

**Figure 123. Encoder Groups window**




**To create encoder groups:**

1. Enter the name of the group.
2. Click on the preset button you want to assign to this encoder group.
3. Click on the encoders you want to assign to the group.
4. Click **Submit**.

*Note: It is possible to assign one encoder to two different encoder groups.*

# Starting an encoder group

To start an encoder group, click the **Start** link to the right in the **Start** column of the group you want to start. The encoder group will start in a few seconds. The system displays any errors on the Starting window while the group starts.

*Note: With each encoder started, more system resources (CPU cycles) are consumed. It is recommended that the total CPU threshold not exceed an average of 80 %. Refer to the* Checking CPU usage.

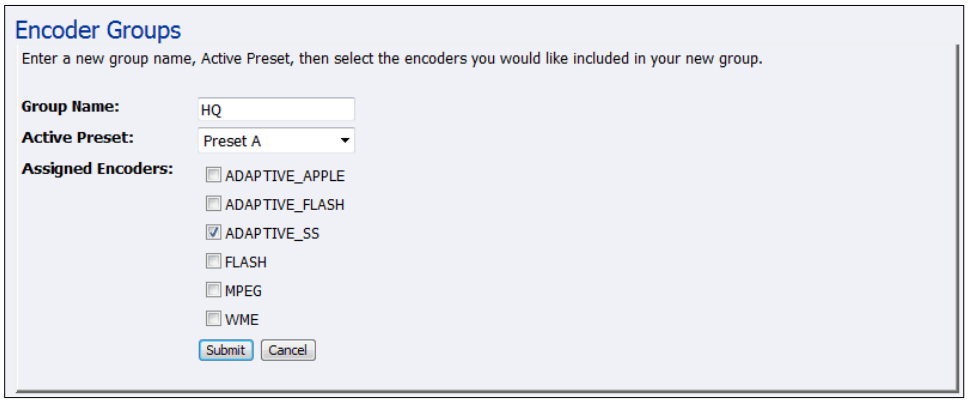
# Stopping an encoder group

To stop an encoder group, click the **Stop** link to the right in the **Stop** column of the group you want to stop. The encoder group will stop in a few seconds. The system displays any errors on the Stopping window while the group stops.

# Editing encoder groups

Select the **Edit** link on the **Encoder Groups** window. The encoder groups fields display (Figure 124).

**Figure 124. Encoder Groups Window**




**To edit encoder groups:**

1. Enter the name of the group.
2. Click on the preset button you want to assign to this encoder group.
3. Click on the encoders you want to assign to the group.
4. Click **Submit**.

# *Additional Settings and Features*

Additional settings and features include:

- Preset ABC buttons
- Machine properties
- Alerts
- IP route table
- Network properties
- System configuration settings
- Activity log
- External storage device

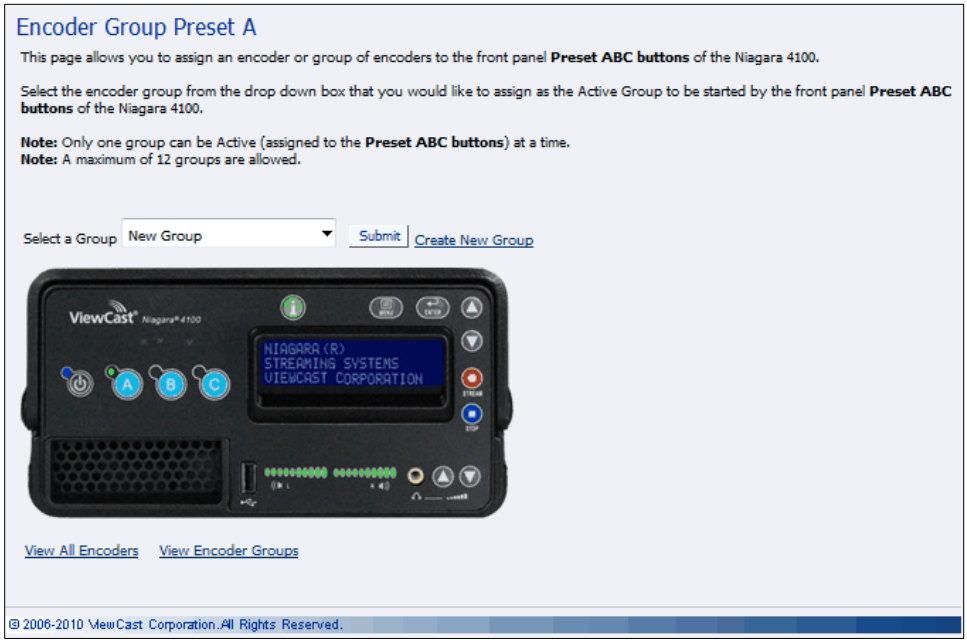
## Configuring the Preset ABC buttons

The Niagara 4100 streaming media system provides one-button streaming via the Preset ABC buttons located on the front panel of the system. By default, these buttons are not assigned. Use the web interface to configure or preset each button to a specific group of encoders. (A preset is a quick way to select and stream a group of encoder profiles.) Before you can configure the Preset ABC buttons, you need to configure groups. The controls to configure these buttons are on the **Encoder Preset A**, **Encoder Preset B**, and **Encoder Preset C** windows. Each window shows a graphic representation of the front panel of the Niagara 4100.

An **Edit Encoder** link appears next to the **View All Encoders** link at the bottom of the window if an encoder is assigned to this button.

To begin configuring the Preset ABC buttons, on the home page click **Encoders ➢ Preset A.** The **Encoder Preset A** window appears.

**Figure 125. Encoder Preset A window**


Encoder Group Preset A
This page allows you to assign an encoder or group of encoders to the front panel Preset ABC buttons of the Niagara 4100.
Select the encoder group from the drop down box that you would like to assign as the Active Group to be started by the front panel Preset ABC buttons of the Niagara 4100.
Note: Only one group can be Active (assigned to the Preset ABC buttons) at a time.
Note: A maximum of 12 groups are allowed.
Select a Group
New Group
Submit
Create New Group
ViewCast
NIAGARA (R)
STREAMING SYSTEMS
VIEWCAST CORPORATION
A
B
C
View All Encoders
View Encoder Groups
© 2006-2010 ViewCast Corporation. All Rights Reserved.

**To assign Preset A button:**

1. Click the drop-down list in the **Select a Group** field. A complete list of all groups available on the Niagara 4100 appears.
2. Select a group.
3. Click **Submit**.
4. Repeat steps one through three to set an encoder for the B and C buttons.

# Using Preset ABC buttons to start an encoder group

Use the **Preset ABC** buttons on the front panel to start the assigned encoder group.

**To use preset buttons to start encoding:**

1. Press the **A**, **B**, or **C** button on the front panel.
2. Press **Stream** to start encoding. The indicator light next to the preset button displays to indicate a positive video stream and the audio meters display to indicate positive audio tracking.

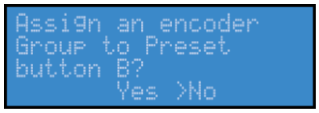
   *WARNING! Limitations exist for the number of streams you can encode simultaneously. If you attempt to encode more streams than the Niagara 4100 can process simultaneously, the streams drop frames and the video stutters. This results in a poor viewer experience. If you fail to reduce the number of sessions to reduce CPU load, unexpected system behavior could occur.*
3. If you press a Preset button and no encoder groups are assigned to this button, the no encoders screen appears (Figure 126).

   **Figure 126. No encoders screen**

   Press **Enter**. The assign an encoder screen appears (Figure 127).

   **Figure 127. Assign an encoders screen**

   *Note: You must define encoder groups before you can assign them to a Preset button.*
4. Use the **Up** and **Down** arrows to select **Yes**.
5. Press **Enter**. The select group screen appears (Figure 128).

   **Figure 128. Select group screen**

   
6. Press **Enter**. A screen with the list of available groups appears (Figure 129).

   **Figure 129. Group screen**

7. Use the **Up** and **Down** arrows to select the appropriate group.
8. Press **Enter**. A confirmation screen appears (Figure 130).

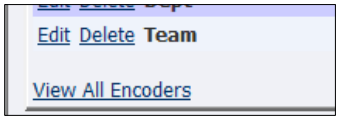
**Figure 130. Confirmation screen**

9. Press **Enter**. A group is now assigned to the Preset button.

# Viewing all encoders

After assigning encoders to the **A**, **B**, and **C** buttons, the system updates the **Preset** column on the Encoder Groups window to reflect these changes. To view these changes, select the **View All Encoders** link at the bottom of the Encoder Groups window (Figure 131).

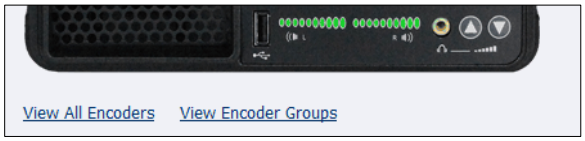
**Figure 131. View All Encoders**




# Editing preset encoders

After assigning encoders to the **A**, **B**, and **C** buttons, you can access the Encoder Properties window by clicking on the **View All Encoders** link at the bottom of the **Preset** window (Figure 132).

**Figure 132. Editing Preset Encoders**

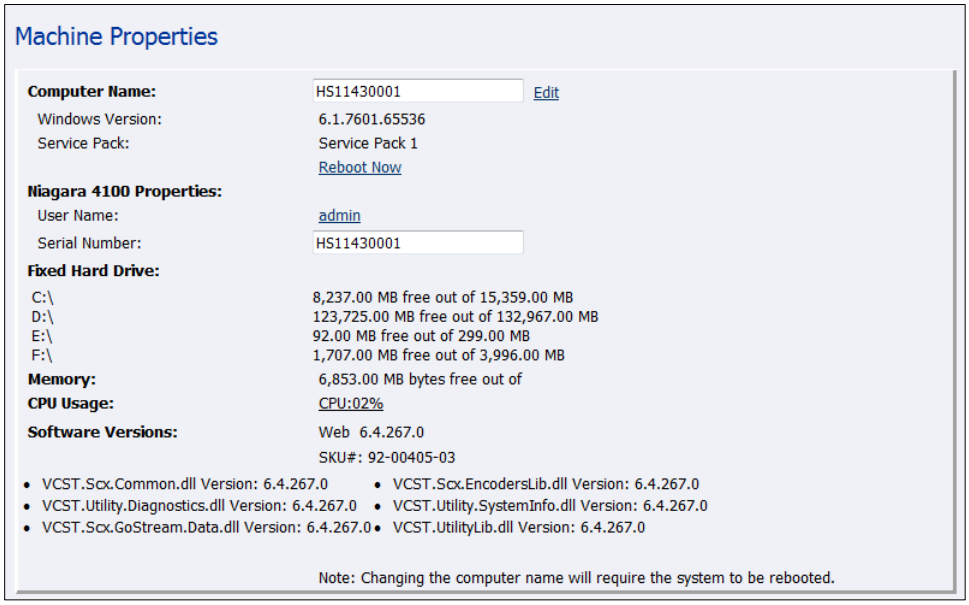


# Configuring machine properties

The Niagara 4100 **Machine Properties** window (Figure 133) provides details on software versions, network name, serial number, and hard drive configurations. Click **Configuration ➢ Machine Properties** from the menu bar on the home page.

*Note: This graphic is for illustration purposes only. The version numbers may be different for your system.*

**Figure 133. Machine Properties window**




Most of the data on this window provides information only and users cannot alter it. However, you can modify two fields:

- Computer Name
- Admin password

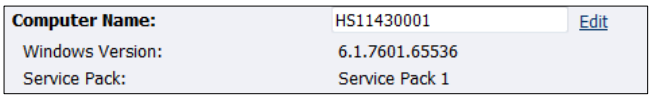
# Changing the computer name

The **Computer Name** field contains the current network name for the Niagara 4100. This name is the same name you typed into the web browser to access the Niagara SCX web interface.

**To change computer name:**

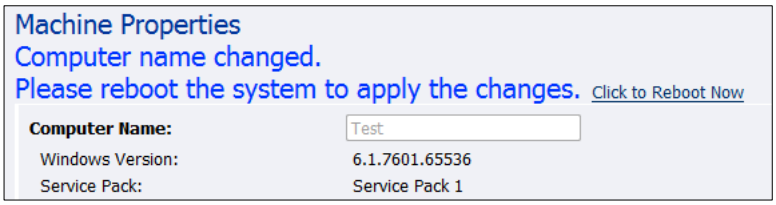
1. Click the **Edit** link next to the **Computer Name** field (Figure 134).

   **Figure 134. Computer Name field**

2. The screen refreshes and the **Computer Name** field becomes an editable text field. Type in a new name for the Niagara 4100.
3. Click **Submit** at the bottom of the page. The page refreshes, and the system prompts you to reboot the Niagara 4100. Your changes do not take effect until the system restarts (Figure 135).

   **Figure 135. Reboot message**

4. Click the **Click to Reboot Now** link to restart the system and apply the **Computer Name** change.

   *Note: The restart process takes several minutes to complete.*

   *When the Niagara 4100 restarts, use the new system name in the IE browser URL to return to the Login window.*

   *If you close your web browser and later want to log into the web interface, you must use the new computer name you created or the IP address of the system to access the Niagara 4100.*

# Changing the login password from the factory default

The Niagara 4100 Properties section has two fields: **User Name** and **Serial Number**. Only the **User Name** field can be changed, which changes the **User Password** from the factory default (Figure 136).

**Figure 136. Properties section**

**To change login password:**

1. Click the **admin** link in the **User Name** field.

   *Note: The system displays a new window (Figure 137) that allows you to change your login password for the web interface.*

   **Figure 137. Password Change window**

   *Note: You cannot change the User Name for the web interface from this window.*

2. Type your current password in the **Password** field. Continue by typing your desired new password in both the **New Password** and **Confirm New Password** fields. The web interface password is case sensitive.
3. Click the **Change Password** button. The system displays a confirmation page. You must log back into the web interface with your password.

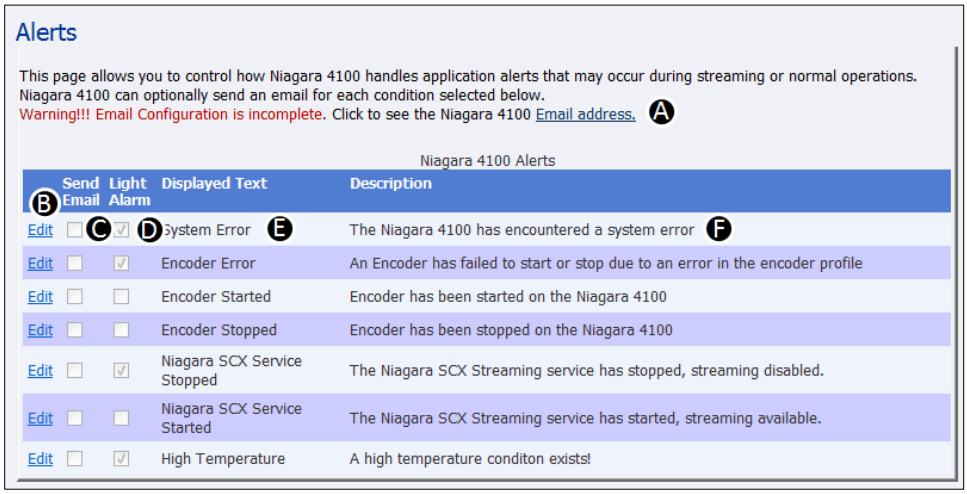
# Restoring the login password to the factory default

If you forget or lose your password, you can restore the default password by running the **Restore 4100 Factory Defaults** option. For more information, see *Restore Niagara 4100 Factory Defaults* in the *System Configuration* section later in this chapter.

# Configuring alerts

Click **Configuration** ➢ **Alerts** from the menu bar on the home page. The Alerts Window (Figure 138) allows you to configure alerts for different situations that may occur during streaming or other operations.

**Figure 138. Alerts window**

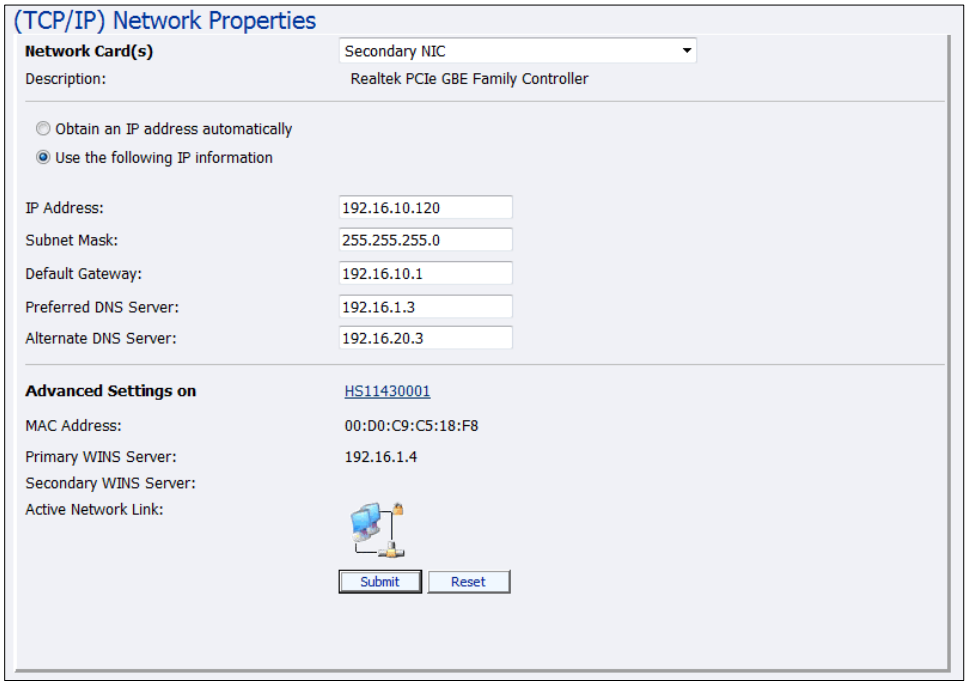

Alerts
This page allows you to control how Niagara 4100 handles application alerts that may occur during streaming or normal operations.
Niagara 4100 can optionally send an email for each condition selected below.
Warning!!! Email Configuration is incomplete. Click to see the Niagara 4100 Email address.
A
Niagara 4100 Alerts
B
Send Email
Light Alarm
Displayed Text
Description
Edit
C
D
System Error
E
The Niagara 4100 has encountered a system error
F
Edit
Encoder Error
An Encoder has failed to start or stop due to an error in the encoder profile
Edit
Encoder Started
Encoder has been started on the Niagara 4100
Edit
Encoder Stopped
Encoder has been stopped on the Niagara 4100
Edit
Niagara SCX Service Stopped
The Niagara SCX Streaming service has stopped, streaming disabled.
Edit
Niagara SCX Service Started
The Niagara SCX Streaming service has started, streaming available.
Edit
High Temperature
A high temperature conditon exists!

| | |
|---|---|
| **A** | Click the **Email address** link to configure email settings on the System Configuration Settings window. |
| **B** | Click the **Edit** link next to the alert you want to change settings on. |
| **C** | Select **Send Email** to send an email to multiple recipients should an alarm occur.<br>*Note: You can optionally send an email alert to specific email address in the event of an application alarm. You must specify the email address where you want an alert sent, along with your email server user name, password, and server name. For more information about configuring the Niagara 4100 to send email alerts, see the System Configuration section.* |
| **D** | Select **Light Alarm**. The alarm light on the front panel of the Niagara 4100 will automatically light when an alarm condition exists. |
| **E** | Displays the type of alert. |
| **F** | Provides a description of the type of alert. |

# Configuring network properties

The **Network Properties** window (Figure 139) provides detailed information on the current network settings for the Niagara 4100 **Network Cards**. Click **Configuration** ➢ **Network Properties** from the menu bar on the home page.

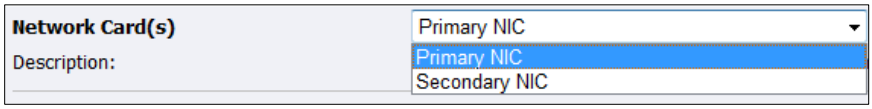
**Figure 139. Network Properties window**




## Configuring network cards

The Niagara 4100 has two 1 Gbit network connections available on the Network Properties window, **Network Card(s)** field). Select the card you wish to view from the drop-down menu in the **Network Card(s)** field (Figure 140) to view the current properties for each card.

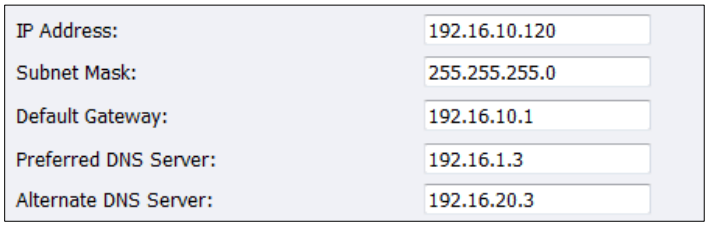
**Figure 140. Network Card options**



# Configuring the IP address

Depending on your system configuration, you may need to configure the **IP Address** (Figure 141).

**Figure 141. IP Address**



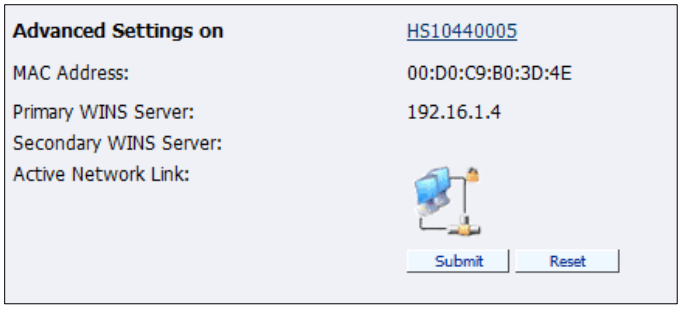

**To configure IP address:**

1. Click the **Use the following IP information** checkbox.
2. Enter the appropriate information in the **IP Address**, **Subnet Mask**, **Default Gateway**, **Preferred DNS Server** and **Alternate DNS Server** fields.
3. Click **Submit**.

# Configuring advanced network settings

Advanced network settings provide the Niagara 4100 network name, MAC Address, and server IP address settings (Figure 142).

**Figure 142. Advanced Settings**




The Niagara 4100 network name (HS10440005) is a link. If you click this link, the system transfers you to the Machine Properties window. From this window, you can change the name of the Niagara 4100.

The **Active Network Link** field uses one of two icons to indicate whether the network interface card selected has a network connected.

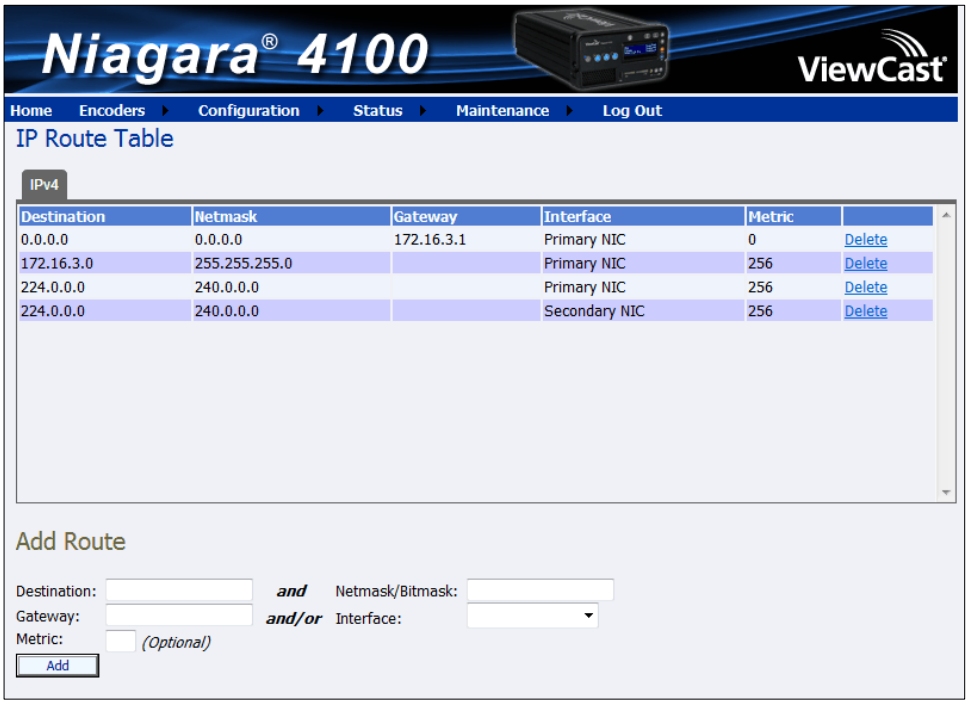
The system detects the network link.

The system does *not* detect the network link.

# IP Route table

This window enables you to change the IP destination. Only experienced professionals should adjust these settings.

**Figure 143. IP Route table**



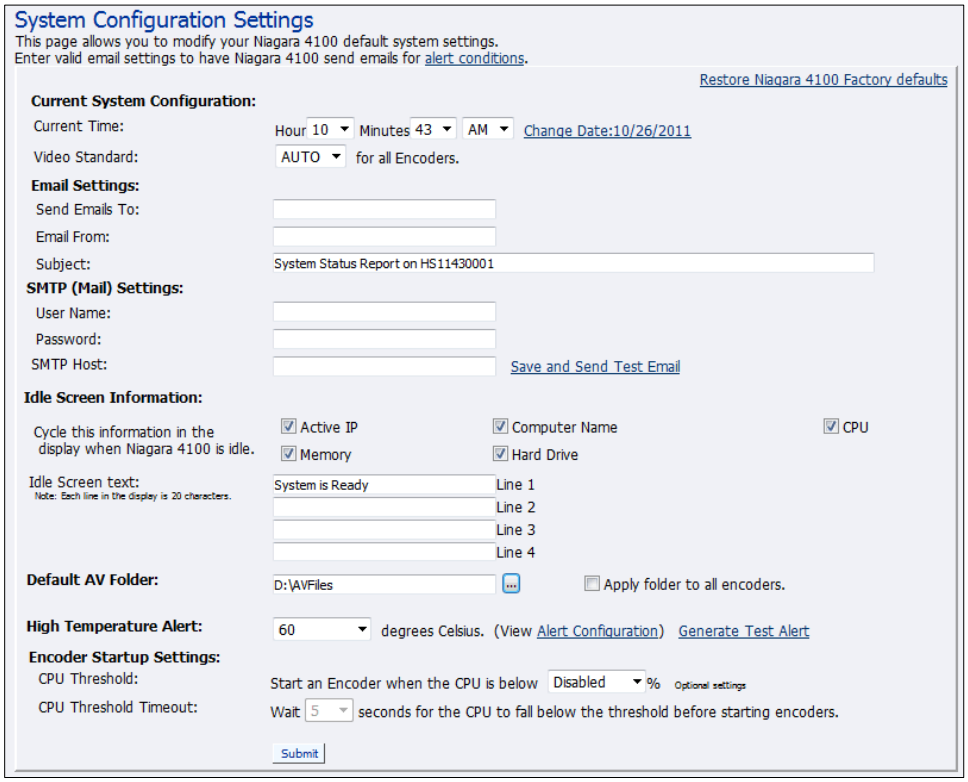
# System configuration settings

The **System Configuration Settings** window (Figure 144) allows you to modify your Niagara 4100 default system settings. You can configure email settings to enable Niagara 4100 to send an email to predefined email addresses any time the Niagara 4100 system encounters an alert condition. You can also customize the information the Niagara 4100 displays on its front panel when the system is in idle mode.

This window also allows you to restore your Niagara 4100 to its original factory disk image and return all the system settings to their original states. Using the **Factory Restore** option removes all custom settings. It takes approximately 15 to 40 minutes to complete.

Click **Configuration** ➢ **System Configuration** from the menu bar on the home page.

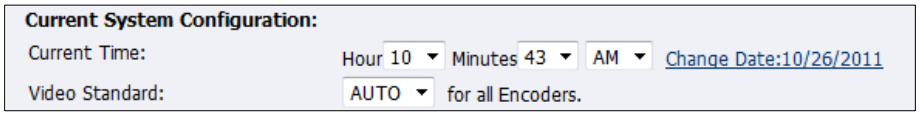
**Figure 144. System Configuration Settings window**



# Setting current system configuration

You can set the current time, date, and the video standard for all encoders (Figure 145).

**Figure 145. Current System Configuration**

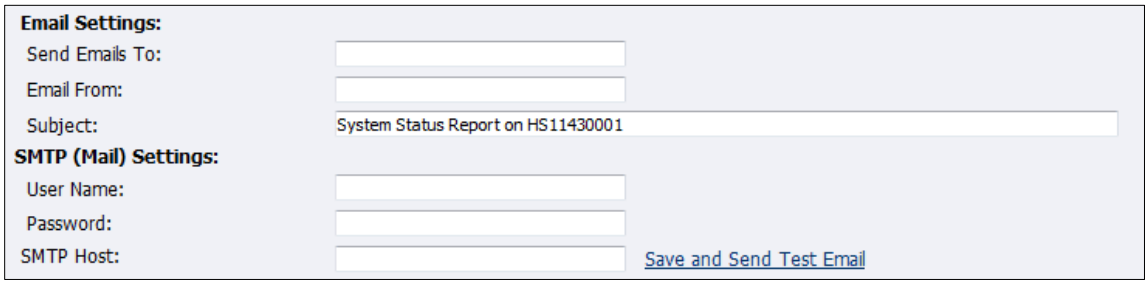



**To set current system configuration:**

1. Click the **Hour** in the drop-down list.
2. Click the **Minutes** in the drop-down list.
3. Click **AM** or **PM** in the drop-down list.
4. Click the **Change Date** link. A calendar appears.
5. Click the date on the calendar.
6. The Osprey 700 automatically defines the **Video Standard**.
7. Click **Submit**.

# Configuring email/SMTP settings

**Figure 146. Email/SMTP Settings fields**




**To configure email settings:**

1. Enter the email address you want the system to send the email. Separate multiple email addresses with a comma.
2. Enter a valid originating email address.
3. Enter a subject line for your email alert.

**To configure SMTP (mail) settings:**

1. Enter the SMTP user name for server access.

   *Note: If you are unfamiliar with setting up an SMTP email account for sending email, contact your network administrator for assistance.*

2. Enter the password if required.

   *Note: For security purposes, the password for your account does not display once the system enters it into the Niagara 4100 settings. Although this field appears blank after you click Submit, the system retains the password information.*

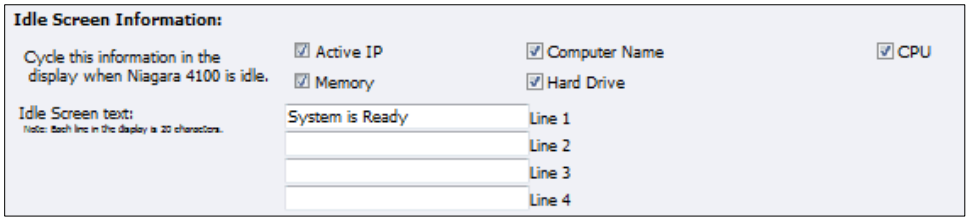
   *If you change any information in this dialog box, you need to re-enter your SMTP password before clicking Submit. Not doing so overwrites the previously entered password with a blank entry.*

3. Enter the name of the SMTP server.
4. Click the **Save and Send Test Email** to test your settings. The resulting window reports the email as successful or it sends information that a send failure occurred.
5. Click **Submit**.

# Configuring idle screen information

You can modify the information displayed in the Niagara 4100 LCD display on the touch panel. The information you select cycles through the LCD display screen and alternates between status and encoder information (Figure 147).

**Figure 147. Idle Screen Information**




**To configure idle screen information:**

1. Click the checkboxes next to the information you wish the screen to display.
2. The default text for Line 1 is **System is Ready**. Enter the message you wish to appear.
3. Enter the text you want to appear in **Lines 2**, **3**, and **4**.
4. Click **Submit**.

# Configuring default directory setting

The Niagara 4100 stores AV files when you select the **Save to File** option in the Output tab of the encoder profile in the **Default AV Folder** field (Figure 148). Refer to the **Save to File** option under the Flash Encoder Properties sections for information on setting an encoder profile to create an AV file.

*Note: ViewCast strongly recommends you do not alter the default directory setting unless you understand the risk of saving your files to a directory not located on drive D. If you save your files to another drive on the Niagara 4100, the system could delete the files when you use the Restore to Niagara 4100 Factory Defaults feature.*

*Only drive D on the Niagara 4100 has available storage to save your files. Check the drive properties for available free space to determine your storage capacity.*

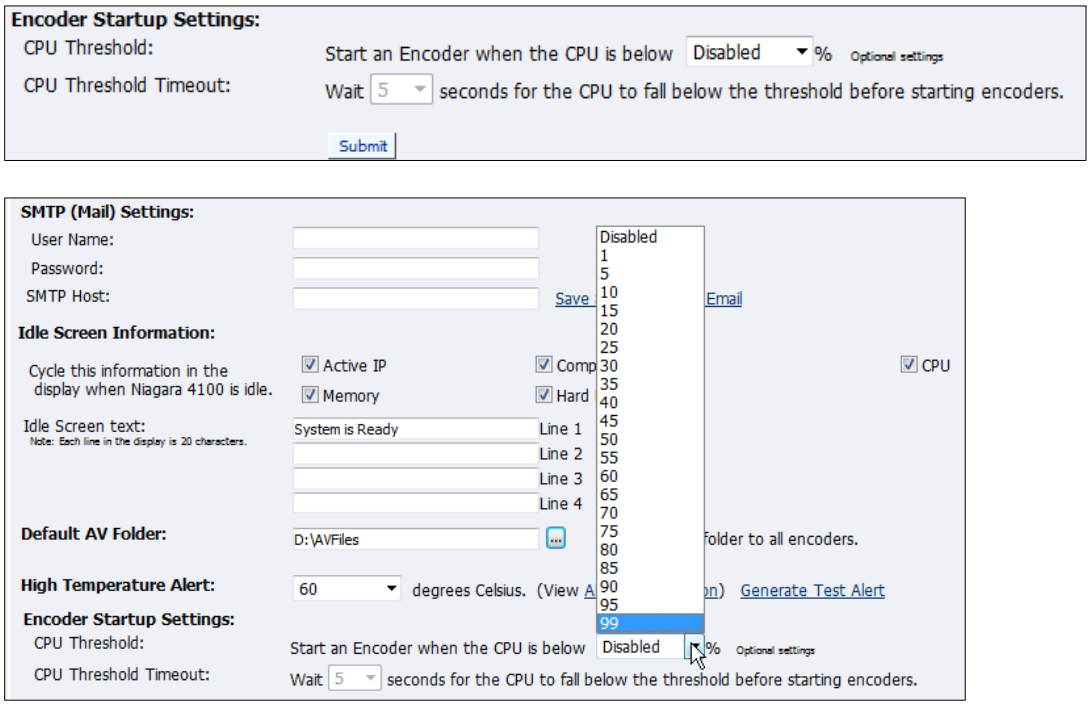
*Use drives C, E, and F strictly for the Niagara 4100 operational programs. Any modifications to these drives can permanently damage your system and void your warranty.*

**Figure 148. Default AV Folder field**

# Setting CPU thresholds

You may set the **CPU Threshold** field (Figure 149) to accommodate optimal encoding capabilities. You also may set the time between repetitive intervals for checking the CPU threshold.

**Figure 149. Encoder Startup Settings**




*Note: ViewCast recommends a CPU threshold setting of 80 % or lower.*

# Restoring Niagara 4100 factory defaults

The **Restore Niagara 4100 Factory defaults** link allows you to restore drive C to its original factory system defaults. This action removes all data (including stored files) on the primary drive and reinstalls the original factory image.

*Note: Select this option only if you wish to return your system to its factory defaults. Selecting this option erases all data currently stored on drive C and stops all currently running programs. Remove any USB memory device before performing a Factory Restore.*

This operation takes approximately 15 to 45 minutes to complete. Do *not* power off or interrupt the system restore once it starts. All services automatically restart when the system restore completes. You may then use the Niagara 4100 web interface tool to reset the time, date, and video format.

Click the **Restore Niagara 4100 Factory defaults** link on the **Configuration ➢ System Configuration Settings** window to start the process. The resulting window (Figure 150) allows you to return to the home page, thereby cancelling this action, or continue with the restore action.

**Figure 150. Restore Factory Defaults window**

Niagara® 4100
ViewCast
Home
Encoders
Configuration
Status
Maintenance
Log Out
Restore Factory Defaults
Restore to Factory Defaults will fully restore the primary drive (C:) to the original factory system defaults. This operation will remove all data (including stored files) on the primary drive and will reinstall the original factory image.
This operation should only be selected if you wish to return to the factory defaults. SELECTING THIS OPERATION WILL ERASE ALL DATA CURRENTLY STORED ON THE C: DRIVE AND WILL STOP ALL RUNNING PROGRAMS. Completing this operation will take approximately 40 minutes.
Do not power off or interrupt the system restore once it has started. All services will automatically restart when the system restore has completed. You may then reset the time, date, and video format using the Web interface tool.
Check this box to save the existing Encoder profiles during Factory Restore
Restore to Factory Defaults
Back to Home Page

The window provides you details regarding the process you are about to execute and allows you the opportunity to once again cancel the process by clicking **Back to Home Page**.

*Note: Restore to Factory Defaults rebuilds the Niagara 4100 primary disk drive C with the original system image. You lose all custom settings and any files saved to drive C. You cannot reverse this process. However, you can manually re-enter your custom settings once the Niagara 4100 restore process completes.*

*Use the default directory, D:\AV Files\, for saving your audio and video files. The system only re-images drive C when you use the Restore Factory Defaults option. It preserves all files and folders on drive D. Always use the default directory – drive D – for storage of personal files to ensure the system does not remove your personal files.*

*IMPORTANT! Remember that the system deletes all previously stored encoder profiles and groups when you restore it to its factory defaults unless the checkbox to save profiles is checked.*

# Viewing the activity log

The Activity Log records the encoder Start and Stop events (Figure 151). The system updates the log for every event including the date and time. To view the activity log, on the home page click **Status ➢ View Activity Log.**

**Figure 151. Activity Log window**

Niagara® 4100
ViewCast
Home
Encoders
Configuration
Status
Maintenance
Log Out
Activity Log
A
Clear Activity Log
View Activity Types:
Show All
D
Created
B
Type
C
Description
E
12/10/2012 2:09:00 PM General Encoder WME Stopped
12/10/2012 2:08:49 PM General Encoder WME Started
12/10/2012 2:08:47 PM General Encoder WME Stopped
12/10/2012 2:07:26 PM General User:Niagara 4100WebUser connected to Niagara SCX from machine EHS1249001
12/10/2012 11:24:29 AM General User:USER_EHS1249001 connected to Niagara SCX from machine EHS1249001
12/10/2012 12:53:20 AM General User:USER_EHS1249001 connected to Niagara SCX from machine EHS1249001
12/8/2012 7:53:18 PM General User:USER_EHS1249001 connected to Niagara SCX from machine EHS1249001
12/7/2012 5:33:03 PM General User:USER_EHS1249001 connected to Niagara SCX from machine EHS1249001
12/7/2012 5:32:43 PM General User:USER_EHS1249001 connected to Niagara SCX from machine EHS1249001
12/7/2012 5:08:38 PM General User:Niagara 4100WebUser connected to Niagara SCX from machine EHS1249001
12/7/2012 4:57:22 PM General User:USER_EHS1249001 connected to Niagara SCX from machine EHS1249001
12/7/2012 4:57:21 PM General User:Niagara 4100WebUser connected to Niagara SCX from machine EHS1249001
12/7/2012 4:12:58 PM General User:USER_EHS1249001 connected to Niagara SCX from machine EHS1249001
12/7/2012 3:51:40 PM General User:USER_EHS1249001 connected to Niagara SCX from machine EHS1249001
12/7/2012 3:20:36 PM General Encoder WME Started
12/7/2012 3:15:02 PM General Encoder Apple Adaptive Stopped
12/7/2012 3:11:47 PM General Encoder Apple Adaptive Started
12/7/2012 3:07:08 PM General User:USER_EHS1249001 connected to Niagara SCX from machine EHS1249001
12/7/2012 3:01:37 PM General User:USER_EHS1249001 connected to Niagara SCX from machine EHS1249001
12/7/2012 2:53:24 PM General User:USER_EHS1249001 connected to Niagara SCX from machine EHS1249001
12/7/2012 2:51:16 PM General Started Niagara Embedded UI Service successfully
12/7/2012 2:51:09 PM General Starting Niagara Embedded UI Service
12/7/2012 2:49:46 PM General Niagara Embedded UI Service Stopped
12/7/2012 2:49:46 PM Error Niagara SCX Service has been stopped. Streaming unavailable until service is restarted
12/7/2012 2:49:44 PM General Logout from Niagara SCX service successfull
1 2 3 4 5
F
Activity Log | Total records : 135
G

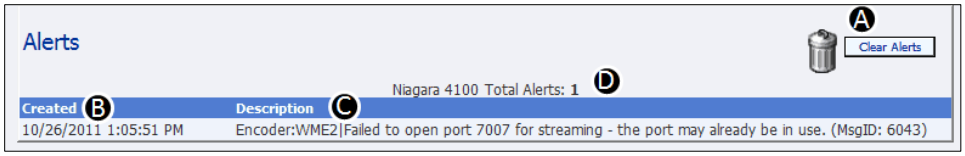
| | |
|---|---|
| **A** | Click this link to clear all logged activities. |
| **B** | Displays the system date and time stamps for each event. |
| **C** | Indicates the type of activity. |
| **D** | Select the types of activity you wish to view. Options include:<br>• Show All<br>• General<br>• Errors<br>• Warnings |
| **E** | Displays a description of the activity. |
| **F** | Click to view multiple pages of activity log. |

| | |
|---|---|
| **G** | Displays the total number of records for the selected view type. Click the icon for a print view of the activity log. When the print friendly view appears, click **File** ➢ **Print** to print a hard copy or save a soft copy of the Activity Log. |

# Viewing alerts

Click **Status** ➢ **View Alerts** from the home page. The Alerts Window (Figure 152) updates with every alert event on the Niagara 4100. The alerts include any specific alert events for the encoder.

**Figure 152. Alerts window**




| | |
|---|---|
| **A** | Click this icon to clear all alerts. |
| **B** | Displays the date and time the alert occurred. |
| **C** | Displays the description for the alert. |
| **D** | Indicates the number of alerts. |

The Alarm Indicator Light on the front panel of the Niagara 4100 turns red when an alert occurs. Press the "**i**" button to view the alert (see *Niagara 4100 front panel diagram*).

# Connecting an external storage device

The Niagara 4100 provides two USB ports, one on the front panel and one on the rear panel. You can connect almost any standard USB memory device to one or both of these ports. This allows you to export any AV files you created on the local storage drive of the Niagara 4100. The encoder defaults to set the local storage drive D when you use the **Save to File** setting with the Niagara 4100 web interface.

When you insert a USB memory device in one of the USB ports on the Niagara 4100, the Niagara 4100 automatically detects the removable storage device, and assigns a drive letter to the device. Use standard Windows methods to transfer AV files from drive D to the attached USB device.

# Using the Niagara SCX web interface

You may wish to perform even more advanced setup and operations. To do so, you may choose to access the Niagara SCX web interface. You may access the Niagara SCX web interface through a remote desktop connection or by connecting a monitor, keyboard, and mouse to the Niagara 4100. Use the *Niagara SCX User Guide* for specific information on how to use the Niagara SCX and the Niagara SCX Explorer software.

# SNMP

This section provides installation and setup information for the ViewCast SNMP agent service. This release supports SNMP v1 and SNMP v2c. SNMP v3 will be supported in future releases.

The native Windows SNMP service implements standard MIB functions such as those defined in RFC1213-MIB, HOST-RESOURCES-MIB including IP address table, interface table (MAC addresses) and traps of cold start, interface link up, link down, etc.

The SuperMicro SNMP agent service is a third-party SNMP agent provided by Super Micro Computer to monitor the health of system devices in the system, such as fan speed, CPU temperature, system temperature, etc.

The ViewCast SNMP agent service will run as the master SNMP agent in the system. It will not only implement ViewCast private MIBs as listed below, but also provide proxy functions to relay SNMP requests/responses associated with those objects managed by other SNMP sub-agents.

- The private MIBs include VIEWCAST-AVENCODER-MIB and VIEWCAST-AVENCODER-TRAP-MIB, etc.

## External SNMP Manager

With ViewCast SNMP agent enabled in each Niagara system, you can start a single SNMP manager at a central location to manage one or multiple systems at the same time.

The external SNMP manager could be a GUI-based commercial or free application tool or an SNMP scripting tool. Which SNMP manager to use is your choice.

# SNMP UDP Ports Used by SNMP Manager and SNMP Agents

## UDP Port for SNMP Requests

SNMP request messages are sent from SNMP manager to SNMP agent. When the external SNMP manager expects to "talk" to the ViewCast SNMP agent, it sends SNMP requests to the ViewCast SNMP agent over the default SNMP UDP port 161 with the following parameters:

- Correct IP address of the encoder system
- Other parameters such as an appropriate community name
- Configure the corresponding community name

*Note: For SNMP v1/v2c version, a community name is treated as a password to access the resources managed by the SNMP agent. Different community names can have different access rights such as NOTIFY ONLY, READ ONLY, WRITE ONLY, READ WRITE and READ CREATE etc.*

You can configure the ViewCast SNMP agent to receive SNMP requests over a different UDP port other than 161. You also have the option to configure the ViewCast SNMP agent to receive SNMP requests over a different UDP port other than 161. Refer to information in this section on how to make these changes.

*Note: Once the SNMP UDP port is configured, you don't have to manually enable it in the firewall setting. Instead, it is automatically enabled when the ViewCast SNMP agent is started.*

## UDP Port for SNMP Traps

SNMP traps are sent from the SNMP agent to the SNMP trap listener. You can monitor and receive SNMP traps over UDP port 162 from one or multiple SNMP-enabled Niagara systems. Perform the following to monitor and receive SNMP traps:

- Configure the IP address where the SNMP trap listener runs as one of the trap destinations for each affected ViewCast SNMP agent.
- Configure the corresponding community name.
- Keep running an SNMP trap listener application to monitor traps over SNMP UDP port 162 with an appropriate community name.
- Allow the trap listener to pass through the firewall on UDP port 162.

*Note: Choosing a trap listener is up to you. The trap listener doesn't have to run on the system. Instead, it runs in a centralized location.*

# Configure ViewCast SNMP Agent Service

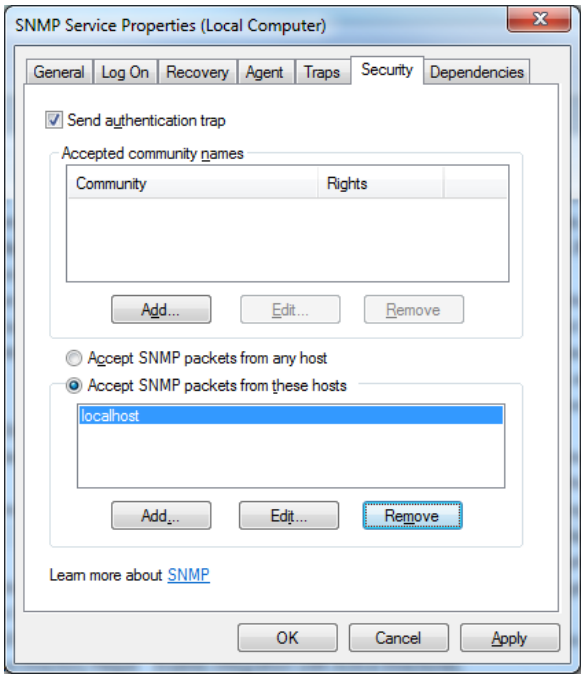
Complete the steps in the following tables to configure ViewCast SNMP Agent service. When the configuration is complete, restart the system.

## Configuring community names

**To configure community names:**

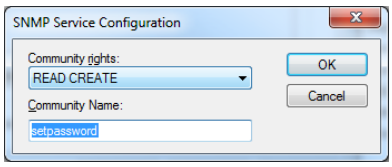
1. Run Windows service management tool services.msc
2. Right click on **SNMP Service** then click **Properties**.
3. Click on the Security tab.

**Figure 153. Security tab**




4. Click **Add** to add community names. For SNMP v1/v2c versions, treat each community name as a password for access control of the SNMP-enabled systems.

**Figure 154. Community Name field**




- You can define multiple community names with different community rights such as NOTIFY, READ ONLY, READ WRITE and READ CREATE.
- You can use these community names to access objects as defined in the standard MIBs (such as RFC1213-MIB) and ViewCast private MIBs (such as VIEWCAST-AVENCODER-MIB and VIEWCAST-AVENCODER-TRAP-MIB).

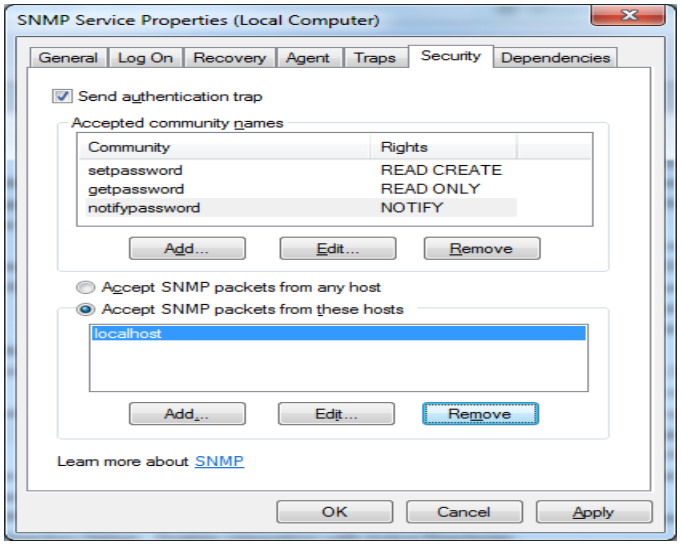
- READ CREATE has the maximum access right while the NOTIFY has the minimum right.
- Community names with NOTIFY permission can be used to monitor traps only, READ ONLY community names can be used to retrieve data only while READ CREATE ones can perform SNMP SET as well as GET requests, etc.

# Configuring permitted SNMP managers

**To configure permitted SNMP managers:**

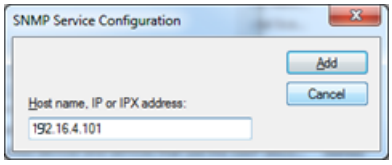
1. Run Windows service management tool services.msc ➢ right click on **SNMP Service**.
2. Click on **Properties**.
3. Click the **Security** tab.

**Figure 155. SNMP Service Properties – Security tab**




4. Select **Accept SNMP packets from these hosts**.
5. Click **Add**.
6. Enter the IP addresses of the permitted SNMP managers in the following window.

**Figure 156. SNMP Service Configuration**

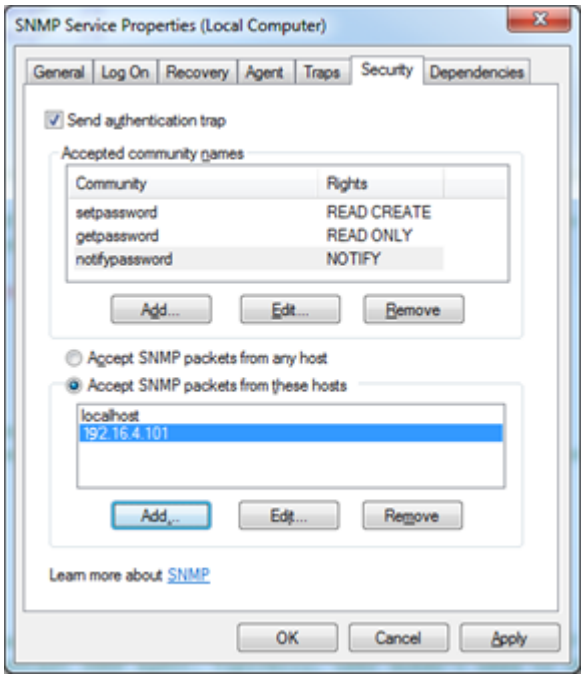



7. Click **Add**.

*Note: The IP address shown above is just an example. It shall be the IP address of the external SNMP manager.*

8. Add all the IP addresses at which external SNMP manager may run.

**Figure 157. IP Addresses**

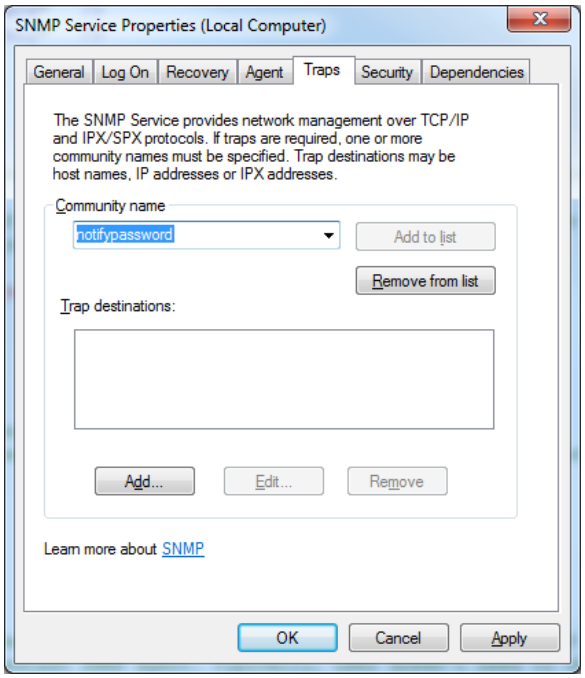


# Configuring trap destinations

**To configure trap destinations:**

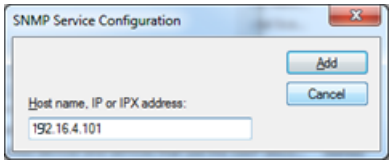
1. Run Windows service management tool services.msc
2. Right click on **SNMP Service** then click on **Properties**.
3. Click on the **Traps** tab.
4. In the Community Name section, enter one of the community names that are defined through the Security tab, for example, **notifypassword**.
5. Click **Add to list**.

**Figure 158. Traps tab**



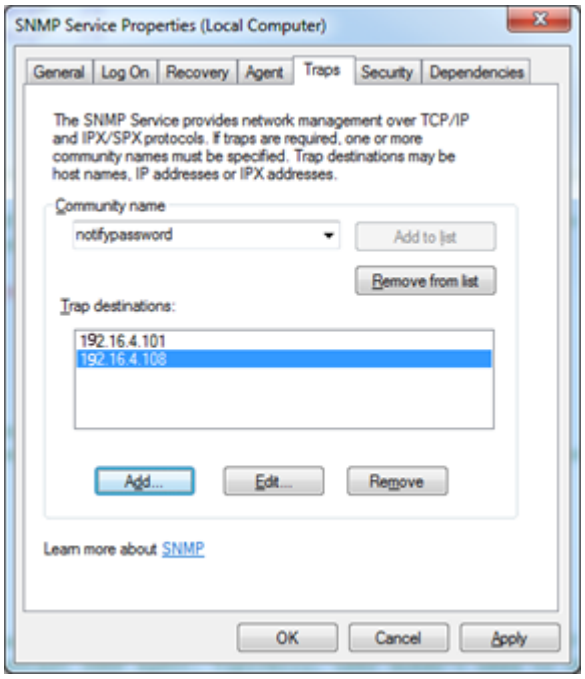

6. In the Trap destinations section, enter the IP address of each trap destination at which the trap listener may run.

**Figure 159. SNMP Service Configuration**



7. After all the IP addresses under the trap destination section are added, click **Apply**.

**Figure 160. Trap destinations**



# Configuring SNMP agent contact and location (optional)

After community names, permitted SNMP managers and trap destinations are configured, you may configure the contact and location information for the associated SNMP agent.

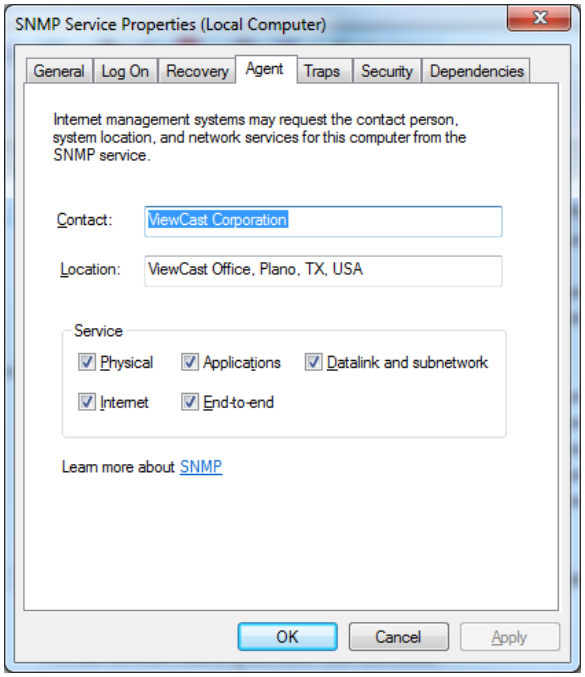
**To configure SNMP Agent contact and location:**

1. Run Windows service management tool services.msc
2. Right click on **SNMP Service** then click on **Properties**.
3. Click on the Agent tab.
4. Enter appropriate **Contact** and **Location** information.

*Notes: You may retrieve the system contact information through SNMP query on .iso.org.dod.internet.mgmt.mib-2.system.sysContact as defined in RFC1213-MIB.*

*You may retrieve the system location information through SNMP query on .iso.org.dod.internet.mgmt.mib-2.system.sysLocation as defined in RFC1213-MIB.*

**Figure 161. Agent tab**



# Use UDP Port Other Than 161 for SNMP Requests

The default UDP port used for SNMP requests sent from SNMP manager to SNMP agent is 161. The ViewCast SNMP agent supports the use of a different UDP port. To make this change, perform the following steps:

**To use UDP port other than 161 for SNMP requests**

1. Access the default installation directory C:\Program Files (x86)\ViewCast\ViewCast SNMP Agent\
2. Make a copy of file vcst_snmp_agent_cfg_example.xml and save it to vcst_snmp_agent_cfg.xml.
3. In vcst_snmp_agent_cfg.xml , keep the default setting unchanged as shown below.

```
snmp_setting_flags>
   <permitted_managers_option  use_win_snmp_settings = "true"  />
   <valid_communities_option   use_win_snmp_settings = "true"  />
   <trap_configuration_option  use_win_snmp_settings = "true"  />
/snmp_setting_flags>
```

4. In vcst_snmp_agent_cfg.xml, for element `udp_port_to_snmp_manager`, set the port attribute to the desired port other than 161, for example 4071 as shown below:

```
udp_port_to_snmp_manager     port = "4071" />
```

5. In vcst_snmp_agent_cfg.xml, keep all the other settings unchanged and save.
6. Restart (or stop then start) ViewCast SNMP agent service by running Windows service management tool services.msc
7. Right click on **ViewCast SNMP Agent**.
8. Click **Restart** or **Stop** then **Start**.
9. Configure the SNMP manager to use the same UDP port for SNMP requests. To revert to the use of UDP port 161, simply rename the file vcst_snmp_agent_cfg.xml or remove it or set the above port to 161.
10. Save and then restart the ViewCast SNMP agent.

# ViewCast SNMP Agent MIB Files

By default, all standard MIB files and ViewCast private MIB files that come with the installation package will be installed into the following directory:

C:\Program Files (x86)\ViewCast\ViewCast SNMP Agent\

You may load the following MIB files into the SNMP manager tool.

- VIEWCAST-AVENCODER-MIB.txt (ViewCast private MIB)
- VIEWCAST-AVENCODER-TRAP-MIB.txt (ViewCast private)
- SUPERMICRO-HEALTH-MIB.txt ( 3rd-party MIB from SuperMicro Computer )
- RFC1213-MIB.txt (Standard SNMP MIB)
- SNMP-COMMUNITY-MIB.txt (Standard SNMP MIB)

# Retrieving IP and MAC Addresses of the Encoder System

The IP address and interface table are part of standard MIB functions as defined in RFC1213-MIB. It is implemented by the native Windows SNMP service.

- The IP address per interface or NIC can be retrieved through .iso.org.dod.internet.mgmt.mib-2.ip.ipAddrTable as defined in RFC1213-MIB.
- The MAC address per interface or NIC can be retrieved through .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.ifPhysAddress as defined in RFC1213-MIB

# SNMP Examples

## Query system information (SNMP GET Example)

**To query system information:**

1. Locate the VIEWCAST-AVENCODER-MIB.txt under C:\Program Files (x86)\ViewCast\ViewCast SNMP Agent\.
2. Load the VIEWCAST-AVENCODER-MIB.txt into the SNMP manager.
3. Set object ID to .iso.org.dod.internet.private.enterprises.viewcast.avencoder.avencoderMIB.systemInfo.
4. Specify correct IP address of the targeted ViewCast SNMP agent: **xx.xx.xx.xx**
5. Verify the Port field is set to **161.**
6. Set SNMP version to **v1.**
7. Specify community such as **getpassword** with at least community right of **READ ONLY**.
8. Send **SNMP GET** request message to the targeted ViewCast SNMP agent.

# Start/stop an encoder through SNMP

Use the same steps to load and expand VIEWCAST-AVENCODER-MIB until .iso.org.dod.internet.private.enterprises.viewcast.avencoder.avencoderMIB.avencoderObjects.avencoderTable.avencoderEntry.avencoderCommand.

**To start/stop an encoder through SNMP:**

1. Use the same method to load and expand VIEWCAST-AVENCODER-MIB until iso.org.dod.internet.private.enterprises.viewcast.avencoder.avencoderMIB.avencoderObjects.avancoderTable.avencoderEntry.avencoderCommand.
2. Set object ID to something like: .iso.org.dod.internet.private.enterprises.viewcast.avencoder.avencoderMIB.avencoderObjects.avencoderTable.avencoderEntry.avencoderCommand.77.80.69.71 where 77.80.69.71 is the ID of the associated encoder.

   *Note: With ViewCast SNMP agent V2.0, the index to the encoder table is no longer the encoder name but an integer ID. Therefore, in this command, set it to something like:*

   *.iso.org.dod.internet.private.enterprises.viewcast.avencoder.avencoderMIB.avencoderObjects.avencoderTable.avencoderEntry.avencoderCommand.10 where '10' is the ID of the associated encoder.*
3. Specify correct IP address of the targeted ViewCast SNMP agent: **xx.xx.xx.xx**
4. Verify the Port field is set to **161.**
5. Set SNMP version to **v1.**
6. Specify community such as **setpassword** with community right of **READ CREATE**.
7. Specify Set Value to **start** or **stop**.
8. Send SNMP SET request message to the targeted ViewCast SNMP agent.

# Start/stop all encoders per group through SNMP

Use the same steps to load and expand VIEWCAST-AVENCODER-MIB until .iso.org.dod.internet.private.enterprises.viewcast.avencoder.avencoderMIB.avencoderObjects.avencoderGroupTable.avencoderGroupEntry.groupCommand.

**To start/stop all encoders per group through SNMP:**

1. Set object ID to something like .iso.org.dod.internet.private.enterprises.viewcast.avencoder.avencoderMIB.avencoderObjects.avencoderGroupTable.avencoderGroupEntry.groupCommand.71.114.111.117.112.49 where **71.114.111.117.112.49** is the ID of the associated encoder group.

   *Note: With ViewCast SNMP agent V2.0, the index to the encoder table is no longer the encoder name but an integer ID. Therefore, in this command, set it to something like:*

   *.iso.org.dod.internet.private.enterprises.viewcast.avencoder.avencoderMIB.avencoderObjects.avencoderTable.avencoderEntry.avencoderCommand.20 where 20 is the ID of the associated encoder group.*
2. Specify correct IP address of the targeted ViewCast SNMP agent: **xx.xx.xx.xx**
3. Verify the Port field is set to **161.**

4. Set SNMP version to **v1.**
5. Specify community such as **setpassword** with community right of **READ CREATE**.
6. Specify Set Value to **start** or **stop**.
7. Send SNMP SET request message to the targeted ViewCast SNMP agent.

# Start/stop all encoders in the system through SNMP

Use the same steps to load and expand VIEWCAST-AVENCODER-MIB until .iso.org.dod.internet.private.enterprises.viewcast.avencoder.avencoderMIB.systemCommand.sysCommand.

**To start/stop all encoders in the system through SNMP:**

1. Set object ID to .iso.org.dod.internet.private.enterprises.viewcast.avencoder.avencoderMIB.systemCommand.sysCommand.
2. Specify correct IP address of the targeted ViewCast SNMP agent: **xx.xx.xx.xx**
3. Verify the Port field is set to **161.**
4. Set SNMP version to **v1.**
5. Specify community such as **setpassword** with community right of **READ CREATE**.
6. Select Set Value to start_all_encoders or stop_all_encoders.
7. Send SNMP SET request message to the targeted ViewCast SNMP agent.

# Start SNMP trap listener

**To start SNMP trap listener:**

1. Locate the VIEWCAST-AVENCODER-TRAP-MIB.txt under C:\Program Files (x86)\\ViewCast\ViewCast SNMP Agent\.
2. Load the VIEWCAST-AVENCODER-TRAP-MIB.txt into the SNMP manager.
3. Verify the Port field is set to **162.**
4. Specify community such as **notifypassword** with at least community right of **NOTIFY**.
5. Select **Authenticate v1/v2c traps** to match community name.
6. Start the Trap Listener.

# Appendix A: DRM for Windows Media

You can protect your content using a technology called Digital Rights Management (DRM). Niagara SCX allows you to encrypt your content with DRM technology while you are encoding. You can apply DRM while encoding to a file and when broadcasting a stream. Users will be required to obtain a license to play the content. This license contains the key to unlock the content and the rights that govern its use.

*Note: Licenses are issued by a third-party license provider, so you must set up an account with a third-party license provider to protect your content.*

Niagara SCX automatically detects any available DRM profiles imported on the encoding system. If no DRM profiles are installed, the DRM functions in Niagara SCX are disabled. To enable the DRM function in Niagara SCX, you must do the following:

- Set up an account with a third-party license provider and create a DRM profile.
- Import the DRM profile using the Windows Media Encoder application included with Niagara streaming systems or available as a free download from Microsoft Corporation (http://www.microsoft.com ).
- Restart the unit on which Niagara SCX is installed, allowing the software to auto-detect and enable its DRM functions.

# Importing a DRM profile

If you have not already done so, set up an account with a licensed provider and create a DRM profile. Once you create the DRM profile, you must use Windows Media Encoder to import the profile on the encoding system.

Windows Media Encoder is included in Niagara streaming media systems that have Niagara SCX version 5.0 or later installed. To access the desktop of the Niagara 4100, attach a keyboard, a mouse, and a monitor to the system. If the system is installed in a location that does not provide physical access, you can use Windows Remote Desktop Connection to access the desktop.

*IMPORTANT! When connecting to a Niagara 4100 using a remote desktop connection, it is extremely important you set the **Local Resources** to **Leave at remote computer** before connecting to the system.*

**To open a remote desktop connection:**

1. Open the Remote Desktop Connection (Figure 162).

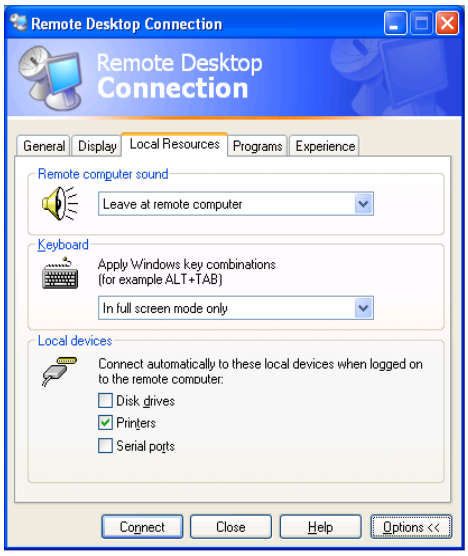
   **Figure 162. Remote Desktop Connection**

2. Click **Options**. The setting tabs display.
3. Click the **Local Resources** tab.

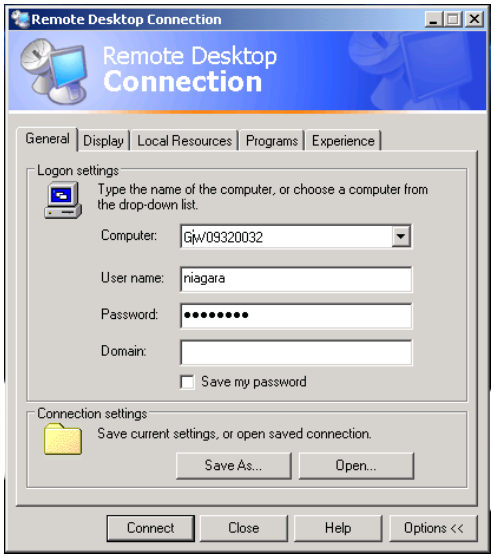
4. Under **Remote computer sound**, click **Leave at remote computer** option from the drop-down list (Figure 163).

**Figure 163. Local Resources tab**




5. Click the **General** tab (Figure 164).

**Figure 164. General tab**




6. In the **User Name** field, type **niagara**.

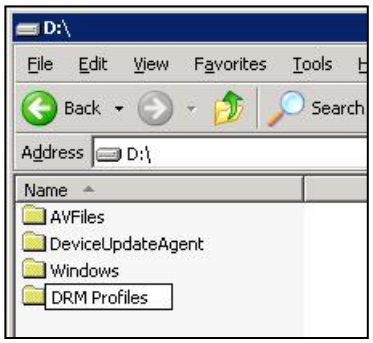
7. In the **Password** field, type password to connect the Niagara 4100 using remote desktop.

*WARNING! When exiting from Remote Desktop Connection, do not log off. Instead, exit/close the session from the Niagara 4100. This step allows its internal programs to continue running.*

8. Copy the DRM profiles to a protected location on the encoding system to ensure they are not accidentally removed or erased (Figure 165).

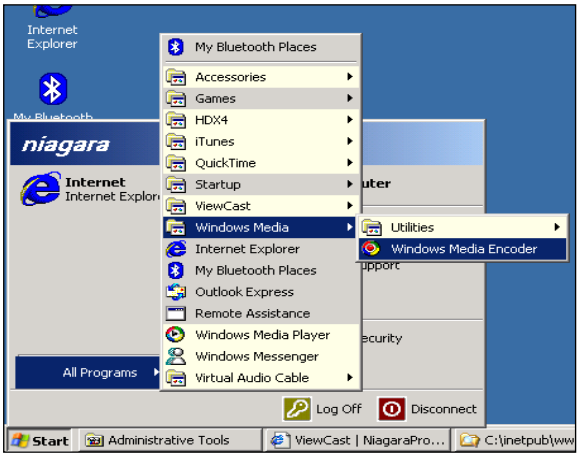
   *Note: ViewCast recommends you create a new directory on drive D on the Niagara 4100 and use this directory to store your DRM profiles.*

**Figure 165. DRM Profiles**



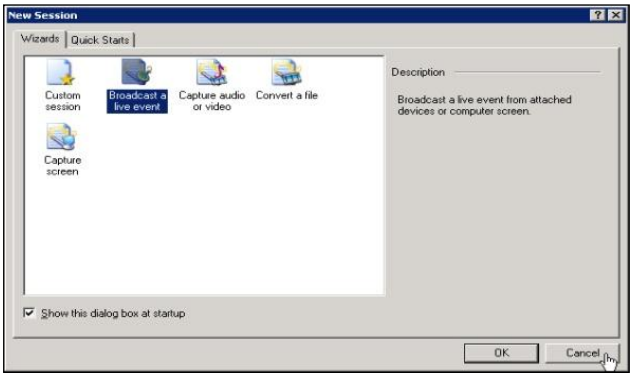

9. Start the Windows Media Encoder application on Niagara 4100 (Figure 166).

**Figure 166. Starting Windows Media Encoder**




10. When the New Session Wizard displays, click **Cancel** (Figure 167).

**Figure 167. New Session Wizard**

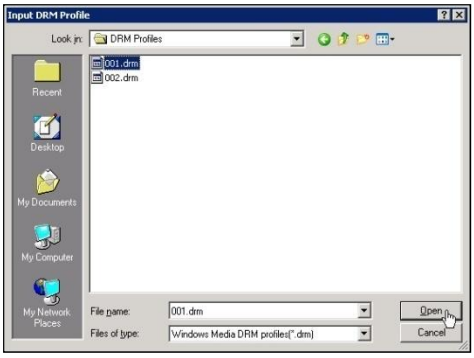


11. Click **Properties** under the top menu bar (Figure 168).

**Figure 168. Properties tab**

12. Click the **Security** tab.
13. Click **Import** and browse to the location of the DRM profiles on the system's hard drive.
14. Select the DRM profile you wish to import and click **Open** (Figure 169).

**Figure 169. DRM Profile**

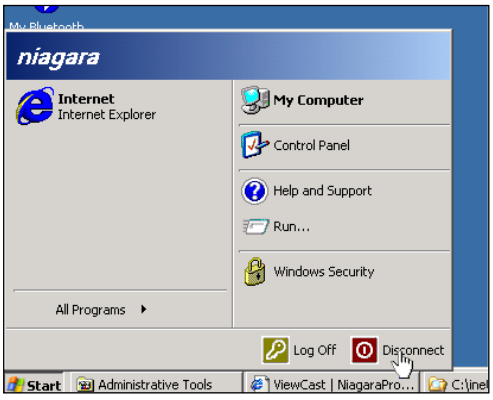



15. Repeat this process for each DRM profile you wish to import.
16. Exit from the Windows Media Encoder application when finished.

*Note: If the system prompts if you want to save your encoding session, click* ***No option****.*

17. **Disconnect** Remote Desktop Connection from Niagara 4100 (Figure 170). *Do not log out.*

**Figure 170. Disconnect Remote Desktop**




18. **Restart** Niagara 4100.

# *Appendix B: H.264 Advanced Settings*

## H.264 Presets

In general, the Main Profile Default presets for the H.264 encoder Custom Presets will meet your streaming requirements. For devices with restricted bandwidths and under certain conditions such as low bit rates, motion specific, or constant bit rate applications, you may need to adjust the Advanced Encoder Settings values in each line. This section includes some information to help you select Advanced Encoder Settings. These examples are suggestions. You should understand and select the appropriate values for your streaming application. See *Settings* for explanations of each setting variable.

| Setting | Value Range |
|---|---|
| BFramesMax | 0 to 4 |
| GOPSize | 1 to 4000 |
| GOPSizeMin | 1 to 4000 |
| InLoopDeblockingFilterAlpha | -6 to 6 |
| InLoopDeblockingFilterBeta | -6 to 6 |
| LookaheadFrames | 0 to 200 |
| NoiseReduction | 0 to 1500 |
| QuantizerMax | 1 to 51 |
| QuantizerMin | 1 to 51 |
| ReferenceFrames | 0 to 16 |
| SceneChangeDetectThreshold | 0 to 4000 |
| TrellisRDQuantization | 0 to 2 |

The following Custom Presets are available for the H.264 Advanced Encoder Settings:

- Baseline Profile
- Baseline Profile - Minimal CPU
- Main Profile Default
- Main Profile – Minimal CPU
- High Profile
- High Profile – Minimal CPU

You can adjust all of the Custom Presets above. The preset titles are only a suggestion that the last three be used for end-user custom modifications, while the first three could remain unmodified if you want to compare the defaults to their own settings. You may also select the **Restore Defaults** link on the lower right-hand corner of the table to set all values for all Custom Presets to the default settings.

Baseline profile is for video conferencing and mobile applications and has the lowest demands on CPU load and memory usage, but the lowest resulting quality. Main profile is for standard-definition TV, while high profile is best for HD video.

*Note: You can use each profile for any resolution video with expected increases in video encode quality and corresponding impacts to CPU and memory. Finally, you may use additional changes to the Advanced Encoder Settings to further refine the video encoding.*

# Settings

| Setting | Explanation |
|---|---|
| BFramesMax | This value sets the maximum number of concurrent B-frames you can use. More B-frames improve video quality but also increase CPU load, in some cases considerably. Only Main or High Profile support B-frames. Changing this value when Baseline Profile is selected has no effect. |
| GOPSize | This value sets the maximum interval between IDR (also called reference) frames. Theoretically, higher values improve compression because I-frames have more data but it can also increase the appearance of fluctuating quality because more P- or B-frames (partial) are used. If you see "pulsing" or "strobing" in the encoded video, this value may be too low. |
| GOPSizeMin | This value sets the minimum length between IDR (reference) frames. This setting limits the minimum length after each I-frame before another can be placed. The suggested default is 1 x the frame rate. |
| InLoopDeblockingFilterAlpha | This value affects the overall amount of deblocking applied to the video. Higher values remove blocky appearance more efficiently, but retain less detail causing the image to appear softened. This value is the most important parameter in determining the overall sharpness of your encode. To make a low bit rate encode look smoother, set this to a positive number. The default value is **0** and should be sufficient to eliminate most blocking. In general, values lower than **-3** and higher than **3** are usually not used, but could be if so desired. |
| InLoopDeblockingFilterBeta | This value determines whether something in a block is a detail or not when deblocking is applied to it. Lower values apply less deblocking to more flat blocks with detail present and more deblocking to blocks without detail. Higher values cause more deblocking to be applied to less flat blocks with details present. Raising the value of Beta deblocking is a good way to get rid of ringing artifacts by applying more aggressive filtering to blocks that are not very flat. Lowering the value of Beta deblocking is a good way to reduce the amount of DCT blocks without blurring the entire picture. Again, the default value of **0** usually is good enough. Set this to a positive number to smooth out low bit rate video encodes. In general, values lower than **-3** and higher than **3** are usually not used, but could be if so desired. |
| LookaheadFrames | This value is the amount of frames the encoder keeps in its |

| Setting | Explanation |
|---|---|
| | buffers to perform various calculations. The higher this value, the better the quality and the closer to a constant bit rate the encoded video will be; however the CPU load is higher and the latency from the source through the encoder is also higher. Setting this to **0,** depending on the encoder, will provide the lowest latency possible. |
| NoiseReduction | This value performs adaptive noise reduction, estimates film noise based on the value and attempts to remove the noise by dropping small details before quantization (**100** to **1000** for de-noising). As a result, using Noise Reduction can make the encoded video look smoother, but with much less detail. |
| QuantizerMax | This value sets the maximum for the quantizer. The range is 1 to **51** with **51** being the highest and least complex quantizer available. The value **51** provides the most encoding, thus making the picture quality farthest away from the original. However, lowering this value increases CPU load, in some cases considerably. Also, this value affects the bit rate with **51** keeping closer to a constant bit rate, while lower values cause the bit rate to vary. |
| QuantizerMin | This value sets the minimum quantizer ever used in the encoder. The lower the quantizer, the closer the encoded video is to the original. For most video, any value below **10** appears almost the same as the original video. |
| ReferenceFrames | This value is the number of previous frames each P-frame can use as a reference. More reference frames increase the quality of the encoded video but increases the CPU load. Each increase, however has reduced benefit and takes longer to encode. |
| SceneChangeDetectThreshold | Higher values of this setting cause the encoder to detect more scene changes. For example, a fast action movie that has many scenes can have this value set lower than a newscast, but the newscast video quality may suffer a bit at the same value. **60** is a good default for most applications. **0** turns off scene change detection, but this is not recommended. Higher values also increase CPU usage. |
| TrellisRDQuantization | This value performs Trellis quantization to increase the visual quality of the encoded video: the higher the value, the better the qualities of the video, but the higher the CPU load. This value can also improve visual quality at lower bit rates. However, settings above **0** are applicable for Main or High Profile in the Custom Presets. |

# MPEG-4 Presets

In general, the Main Profile Default presets for the H.264 encoder Custom Presets will meet your streaming requirements. For devices with restricted bandwidths and under certain conditions such as low bit rates, motion specific, or constant bit rate applications, you may need to adjust the Advanced Encoder Settings values in each line. This section includes some information to help you select those Advanced Encoder Settings. These examples are suggestions and you should understand and select the appropriate values for your streaming application. See *Settings* for explanations of each setting variable.

| Setting | Value Range |
|---|---|
| BFramesMax | 0 to 4 |
| GOPSize | 1 to 4000 |
| GOPSizeMin | 1 to 4000 |
| InterlacedDCTComparison | 0 to 14 |
| LookaheadFrames | 0 to 200 |
| MotionEstimationComparison | 0 to 256 |
| MotionEstimationMethod | 5 to 10 |
| MotionEstimationPenaltyCompensation | 0 to 256 |
| MotionEstimationSubPixelComparison | 0 to 256 |
| MpegQuant | 0 to 1 |
| QuantizerMax | 1 to 51 |
| QuantizerMin | 1 to 51 |
| SceneChangeDetectThreshold | 0 to 4000 |
| TrellisRDQuantization | 0 to 2 |

# Settings

| Setting | Explanation |
|---|---|
| BFramesMax | This value sets the maximum number of concurrent B-frames that you can use. More B-frames improve video quality but also increase CPU load, in some cases considerably. Setting B-frames to a value more than 0 changes the video encoding format from Simple Profile to Advanced Simple Profile. |
| GOPSize | This value sets the maximum interval between key frames. Theoretically, higher values improve compression because I-frames have more data but it can also increase the appearance of fluctuating quality because more P- or B-frames (partial) are used. |
| GOPSizeMin | This value sets the minimum length between key frames. It limits the minimum length after each I-frame before another can be placed. The suggested default is 1 x the frame rate. |
| InterlacedDCTComparison | This value optimizes processing of interlaced video input. It is not usually used, but it may help the encoding quality of interlaced video. |
| LookaheadFrames | This value is the amount of frames the encoder keeps in its buffers to perform various calculations. The higher this value, the better the quality and the closer to a constant bit rate the encoded video will be, however the CPU load is higher and the latency from the source through the encoder is also higher. Setting this to **0,** depending on the encoder will provide the lowest latency possible. |
| MotionEstimationComparison | Setting this value causes the encoder to select what motion estimation comparison to use. **0** is the default for MPEG4 encoding. You can use higher values but they can increase CPU and memory usage, sometimes with minimal significant gain in quality.<br>*Note: The correct range is **0** to **14**, but a value of **256** that affects the color portion of the video only is available. Use this value only when you completely understand the encoding needs. All other values are ignored.* |
| MotionEstimationMethod | Setting this value causes the encoder to select what motion estimation method to use. **5** is the default for MPEG4 encoding. You can use higher values but they can increase CPU and memory usage, sometimes with no significant gain in quality. |
| MotionEstimationPenaltyCompensation | Setting this value causes the encoder to apply a compensation for any errors that arise in the motion estimation while encoding the video. The actual value of |

| Setting | Explanation |
|---|---|
| | **256** corresponds to a value of 1.0 and is set to maximum as the default. |
| MotionEstimationSubPixelComparison | Setting this value causes the encoder to select the sub-pixel motion estimation comparison. **0** is the default for MPEG4 Simple Profile encoding because only Advanced Simple Profile allows for sub-pixel motion estimation. You can use higher values but they can increase CPU and memory usage, sometimes with minimal significant gain in quality.<br>*Note: The correct range is **0** to **14**, but a value of **256** that affects the color portion of the video only is available. Only use this value when you completely understand the encoding needs. All other values are ignored.* |
| MpegQuant | Setting the value of this to **0** will use quantizers for Simple Profile MPEG4 encoding while using **1** will use quantizers for Advanced Simple Profile and for high bit rate encoding more detail from the original video will be preserved. For lower bit rate encoding, using **0** smooths out the video appearance. |
| QuantizerMax | This value sets the maximum for the quantizer in use. The range is 1 to **51** with **51** being the highest and least complex quantizer available. The value **31** is a good default. However lowering this value increases the CPU load, in some cases considerably. Values above **31** are available, but could significantly affect video quality negatively. |
| QuantizerMin | This value sets the minimum quantizer used in the encoder. The lower the quantizer, the closer the encoded video is to the original. For most video, any value below **10** appears almost the same as the original video. |
| SceneChangeDetectThreshold | Higher values of this setting cause the encoder to detect more scene changes and insert extra I-frames as needed. For example, a fast-action movie with many scenes could have this value set lower than a newscast, but the newscast video quality may suffer a little at the same value. **45** is a good default for most applications using MPEG4 encoding. **0** turns off scene change detection, but is not recommended. Higher values also increase CPU usage. |
| TrellisRDQuantization | This value performs Trellis quantization to increase the visual quality of the encoded video by determining the optimal encoding: the higher the value, the better the video quality but the higher the CPU usage. This value can also improve visual quality at lower bit rates. |

# MPEG-2 Presets

In general, the Main Profile Default presets for the H.264 encoder Custom Presets will meet your streaming requirements. For devices with restricted bandwidths and under certain conditions such as low bit rates, motion specific, or constant bit rate applications, you may need to adjust the Advanced Encoder Settings values in each line. This section includes some information to help you select those Advanced Encoder Settings. These examples are suggestions and you should understand and select the appropriate values for your streaming application. See *Settings* for explanations of each setting variable.

| Setting | Value Range |
|---|---|
| BFramesMax | 0 to 4 |
| GOPSize | 1 to 4000 |
| GOPSizeMin | 1 to 4000 |
| InterlacedDCTComparison | 0 to 14 |
| LookaheadFrames | 0 to 200 |
| MotionEstimationComparison | 0 to 256 |
| MotionEstimationMethod | 5 to 10 |
| MotionEstimationPenaltyCompensation | 0 to 256 |
| MotionEstimationSubPixelComparison | 0 to 256 |
| MpegQuant | 0 to 1 |
| QuantizerMax | 1 to 51 |
| QuantizerMin | 1 to 51 |
| SceneChangeDetectThreshold | 0 to 4000 |
| TrellisRDQuantization | 0 to 2 |

# Settings

| Setting | Explanation |
|---|---|
| BFramesMax | This value sets the maximum number of concurrent B-frames that you can use. More B-frames improve video quality but also increase CPU load, in some cases considerably. Setting B-frames to a value more than 0 changes the video encoding format from Simple Profile to Advanced Simple Profile. |
| GOPSize | This value sets the maximum interval between key frames. Theoretically, higher values improve compression because I-frames have more data but it can also increase the appearance of fluctuating quality because more P- or B-frames (partial) are used. |
| GOPSizeMin | This value sets the minimum length between key frames. It limits the minimum length after each I-frame before another can be placed. The suggested default is 1 x the frame rate. |
| InterlacedDCTComparison | This value optimizes processing of interlaced video input. It is not usually used, but it may help the encoding quality of interlaced video. |
| LookaheadFrames | This value is the amount of frames the encoder keeps in its buffers to perform various calculations. The higher this value, the better the quality and the closer to a constant bit rate the encoded video will be, however the CPU load is higher and the latency from the source through the encoder is also higher. Setting this to **0,** depending on the encoder will provide the lowest latency possible. |
| MotionEstimationComparison | Setting this value causes the encoder to select what motion estimation comparison to use. **0** is the default for MPEG2 encoding. You can use higher values but they can increase CPU and memory usage, sometimes with minimal significant gain in quality.<br>*Note: The correct range is **0** to **14**, but a value of **256** that affects the color portion of the video only is available. Use this value only when you completely understand the encoding needs. All other values are ignored.* |
| MotionEstimationMethod | Setting this value causes the encoder to select what motion estimation method to use. **5** is the default for MPEG2 encoding. You can use higher values but they can increase CPU and memory usage, sometimes with no significant gain in quality. |
| MotionEstimationPenaltyCompensation | Setting this value causes the encoder to apply a compensation for any errors that arise in the motion |

| Setting | Explanation |
|---|---|
| | estimation while encoding the video. The actual value of **256** corresponds to a value of 1.0 and is set to maximum as the default. |
| MotionEstimationSubPixelComparison | Setting this value causes the encoder to select the sub-pixel motion estimation comparison. **0** is the default for MPEG2 Simple Profile encoding because only Advanced Simple Profile allows for sub-pixel motion estimation. You can use higher values but they can increase CPU and memory usage, sometimes with minimal significant gain in quality.<br>*Note: The correct range is **0** to **14**, but a value of **256** that affects the color portion of the video only is available. Only use this value when you completely understand the encoding needs. All other values are ignored.* |
| MpegQuant | Setting the value of this to **0** will use quantizers for Simple Profile MPEG2 encoding while using **1** will use quantizers for Advanced Simple Profile and for high bit rate encoding more detail from the original video will be preserved. For lower bit rate encoding, using **0** smooths out the video appearance. |
| QuantizerMax | This value sets the maximum for the quantizer in use. The range is 1 to **51** with **51** being the highest and least complex quantizer available. The value **31** is a good default. However lowering this value increases the CPU load, in some cases considerably. Values above **31** are available, but could significantly affect video quality negatively. |
| QuantizerMin | This value sets the minimum quantizer used in the encoder. The lower the quantizer, the closer the encoded video is to the original. For most video, any value below **10** appears almost the same as the original video. |
| SceneChangeDetectThreshold | Higher values of this setting cause the encoder to detect more scene changes and insert extra I-frames as needed. For example, a fast-action movie with many scenes could have this value set lower than a newscast, but the newscast video quality may suffer a little at the same value. **45** is a good default for most applications using MPEG2 encoding. **0** turns off scene change detection, but is not recommended. Higher values also increase CPU usage. |
| TrellisRDQuantization | This value performs Trellis quantization to increase the visual quality of the encoded video by determining the optimal encoding: the higher the value, the better the video quality but the higher the CPU usage. This value |

| Setting | Explanation |
|---|---|
| | can also improve visual quality at lower bit rates. |

# Appendix C: Mapped Network Drive Setup

Setting up the network drive for the Niagara 4100 to export files, requires setting up two administrator accounts on a remote PC where the shared folder will be located:

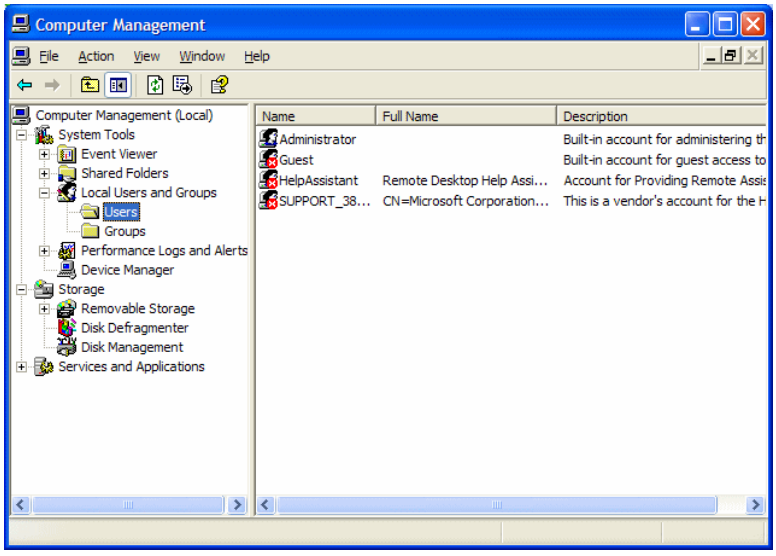
- One account for the username N4100
- One account for the username SCXUser

The shared folder is created on the remote PC with full access for both Niagara 4100 and SCXUser. On the Niagara 4100, the mapped network drive is created to reconnect at logon using the SCXUser username.

**To set up user accounts on a remote PC:**

1. Click on **Start** ➢ **Control Panel**.
2. Double-click on **Administrative Tools**.
3. Double-click on **Computer Management**.
4. Expand Local Users and Groups. Click on **Users**.

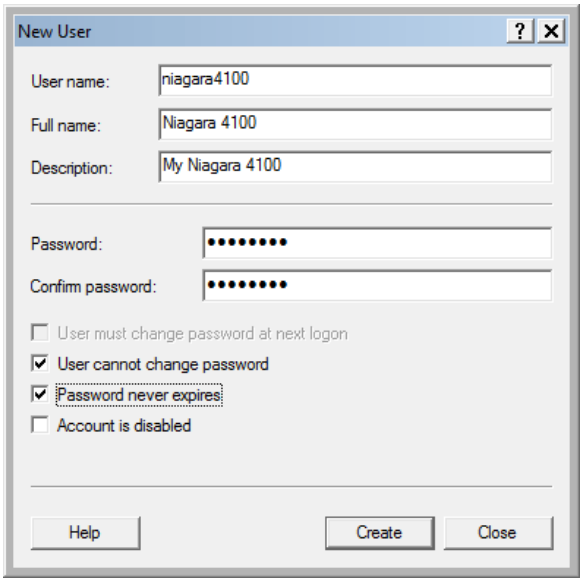
   **Figure 171. Users**




5. Under **Action**, select **New User**.
6. Enter **niagara4100** for the **User name**.
7. **Full name** and **Description** are optional.
8. Enter **viewcast** for the **Password**.

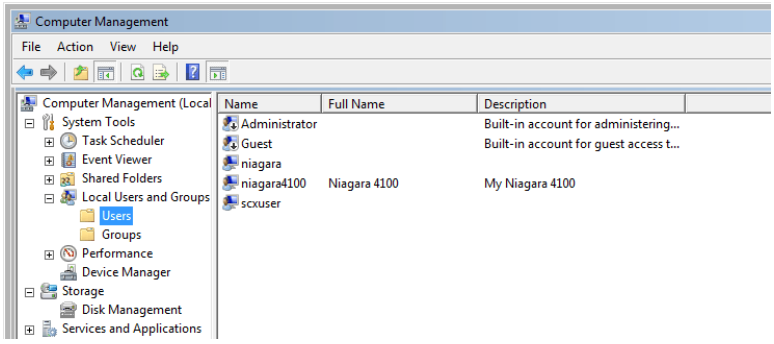
9. Enter **viewcast** for the **Confirm password.**
10. Disable **User must change password at next logon**.
11. Enable **User cannot change password**.
12. Enable **Password never expires**.

**Figure 172. New User window**



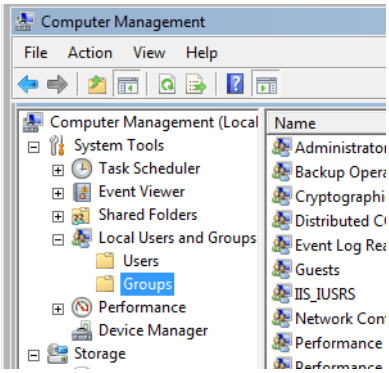

13. Click **Create**.
14. Repeat steps 5 through 13 to create the user **SCXUser** using the password **viewcast**.
15. Click **Close**.
16. The two new users appear in the users list.

**Figure 173. Added Users**



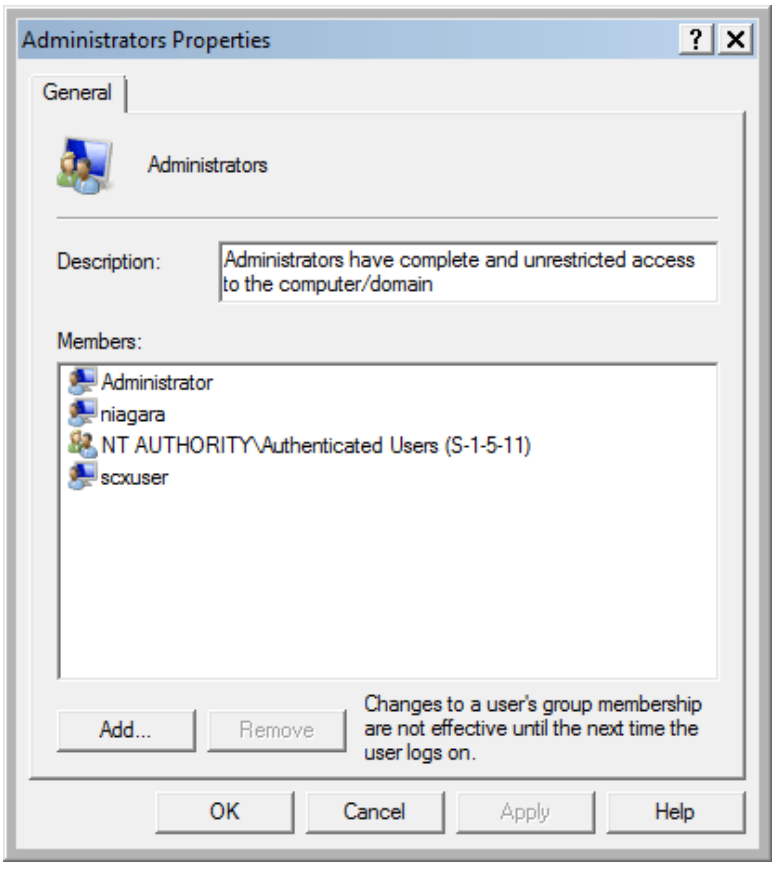
17. In Computer Management, click **Groups**.

**Figure 174. Groups**



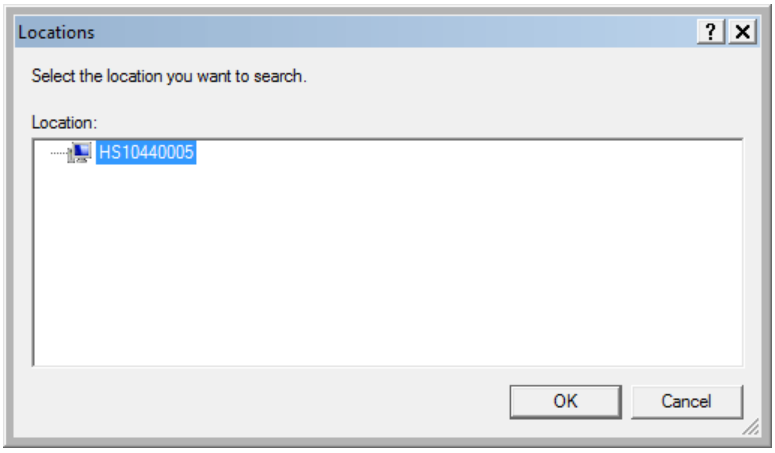

18. Double-click on **Administrators**.
19. Click **Add**.

**Figure 175. Administrators Properties window**



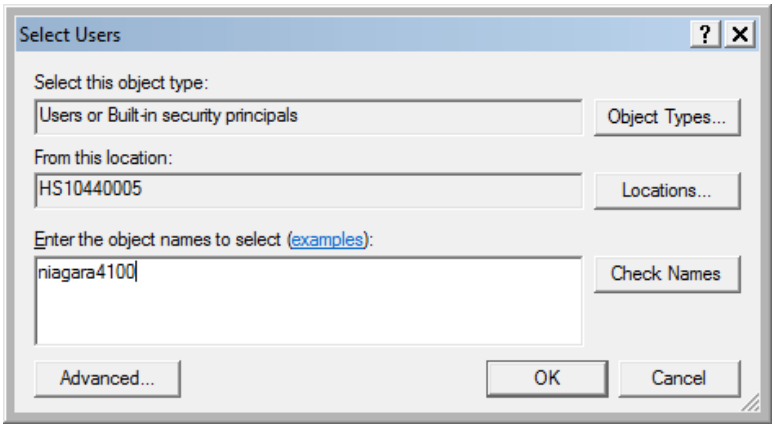

20. Click **Add**. The Select Users window displays.
21. Click **Locations**.
22. Select the PC, then click **OK**.

**Figure 176. Locations window**



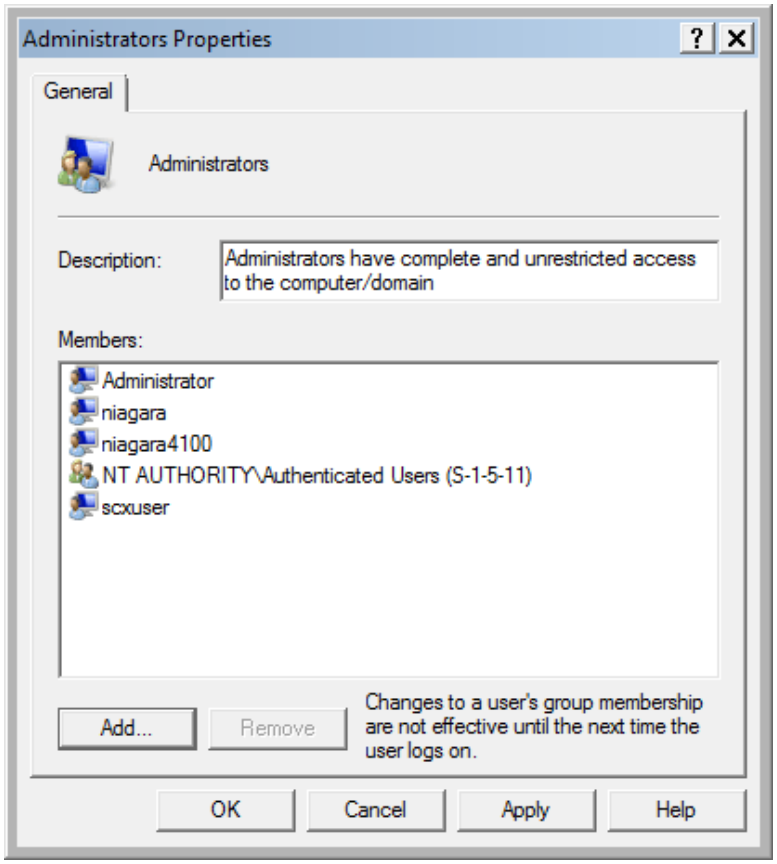

23. Enter **niagara4100** for the object name, then click **OK**.

**Figure 177. Select Users window**



24. The user **niagara4100** appears in the list of Administrators.

**Figure 178. Administrator Properties**



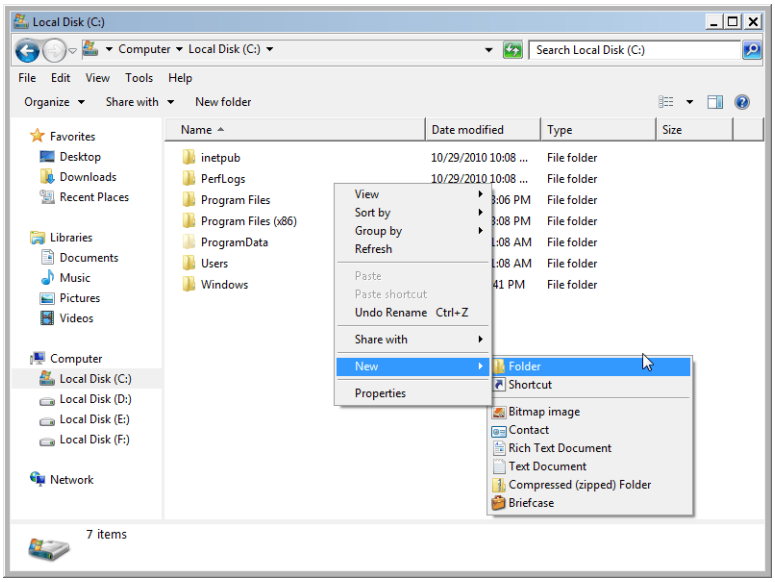

25. Repeat steps 19 through 22 to add SCXUser as an administrator.

**To create the shared folder:**

*Note: The shared folder(s) must be created on the remote PC.*

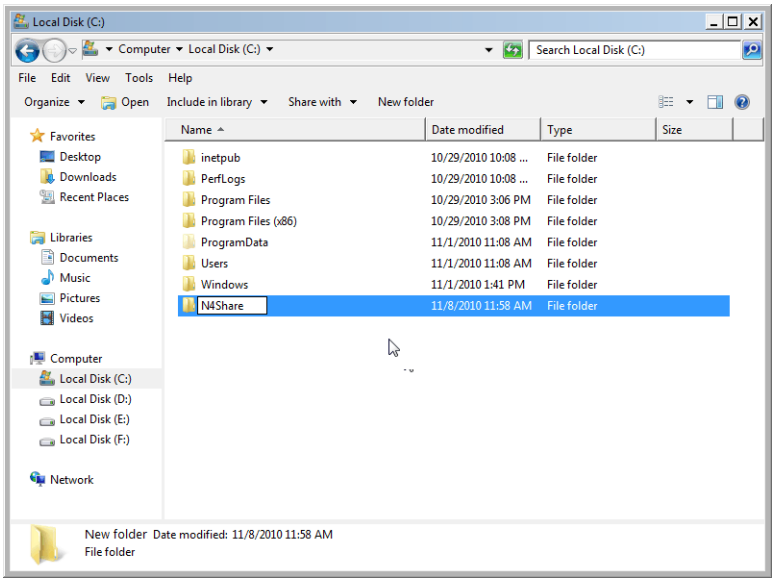
1. Open **My Computer**.
2. Open the drive where the shared folder will be created.
3. Right click, select **New**, then **Folder**.

**Figure 179. Create new folder**



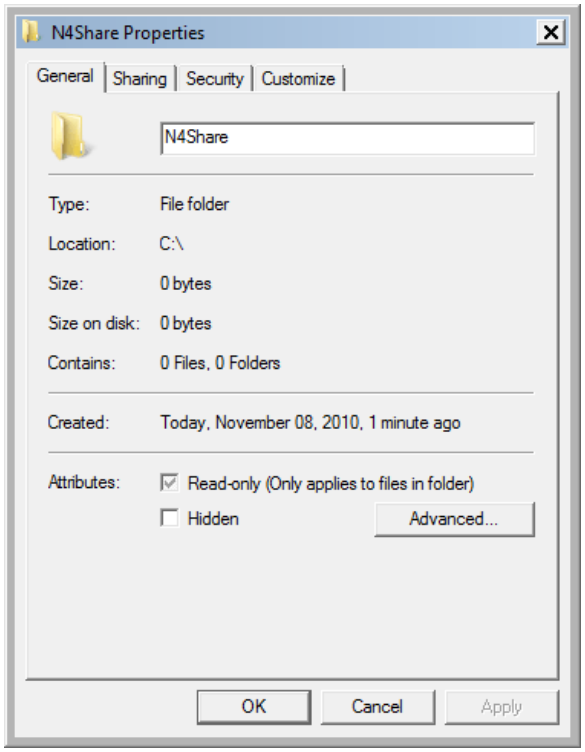

4. Enter a name for the folder (for example, N4Share).

**Figure 180. Folder name**



5. Right click on the folder, then select **Properties**.

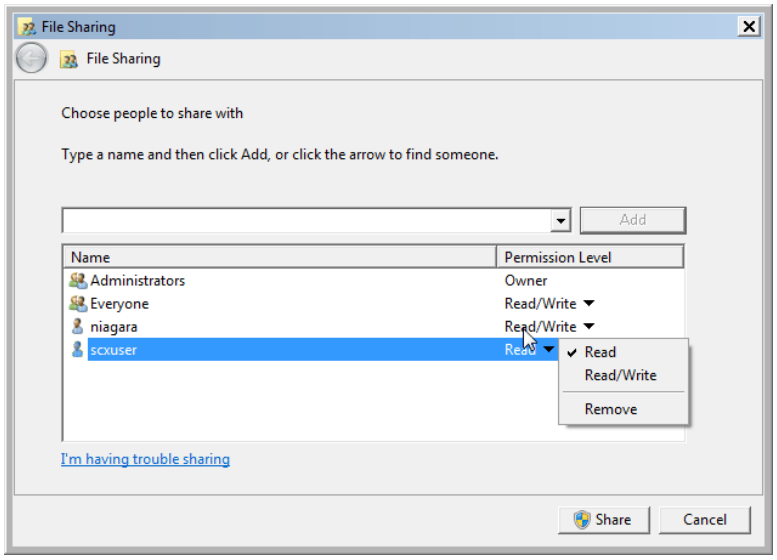
**Figure 181. Folder Properties window**




6. Click on the **Sharing** tab.
7. Click **Share**. The File Sharing window displays.
8. Type a name and then click **Add**, or click the arrow to select someone from the drop-down list.

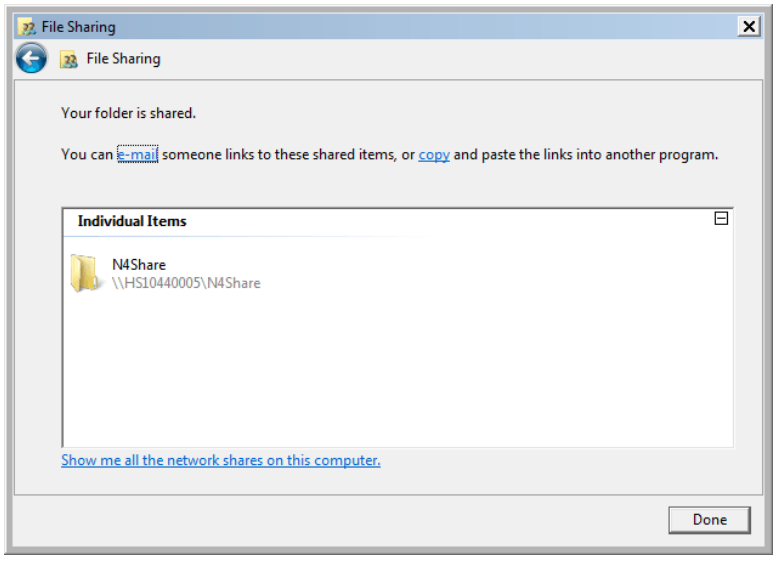
9. Use the drop-down list under permission level for this user and select Read/Write.

**Figure 182. Read/Write permissions**




10. Click **Share**.
11. Repeat steps 2 through 9 to add SCXUser to the Share Permissions.
12. Click **Done**.

**Figure 183. File Sharing window**


File Sharing
File Sharing
Your folder is shared.
You can e-mail someone links to these shared items, or copy and paste the links into another program.
Individual Items
N4Share
\\HS10440005\N4Share
Show me all the network shares on this computer.
Done

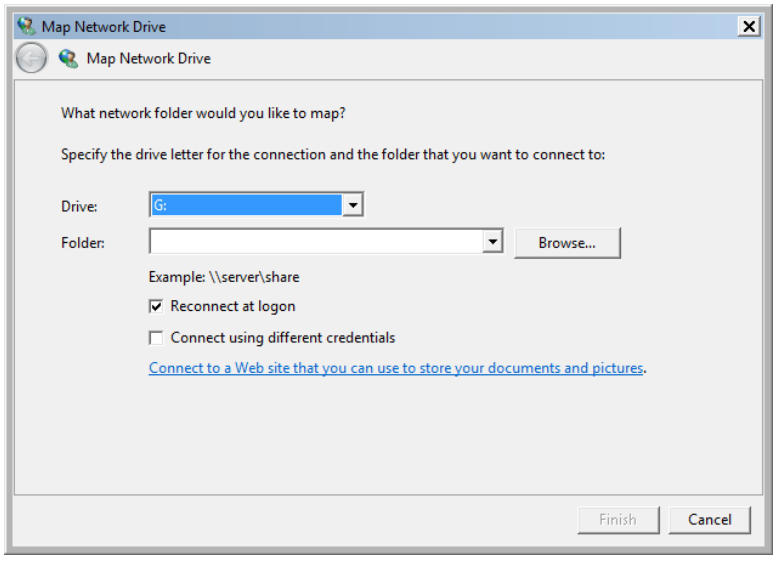
13. Click **Close** to close the share properties.

**To map the network drive:**

*Note: Create a mapped network drive to the remote shared folder that will reconnect at logon. Once the mapped drive is created and the Niagara 4100 is rebooted, the user will be able to export to the network drive.*

1. On the Niagara 4100, open **My Computer**.
2. Under **Tools**, select **Map Network Drive**.
3. Select a drive.

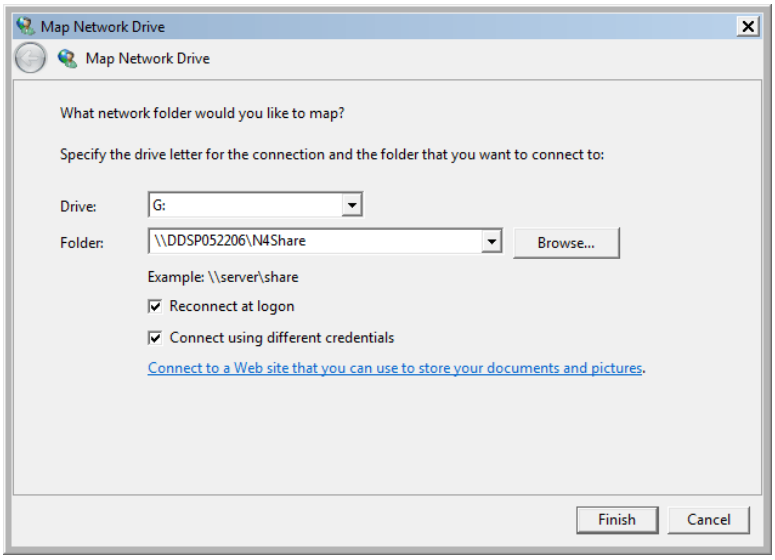
**Figure 184. Map Network Drive window**


Map Network Drive
Map Network Drive
What network folder would you like to map?
Specify the drive letter for the connection and the folder that you want to connect to:
Drive:
G:
Folder:
Browse...
Example: \\server\share
Reconnect at logon
Connect using different credentials
Connect to a Web site that you can use to store your documents and pictures.
Finish
Cancel

4. In the text box for folder, enter the network path to the shared folder on the remote PC (for example, \\DDSP052206\N4Share).
5. Make sure **Reconnect at logon** is enabled.
6. Enable **Connect using different credentials**.

7. Click **Finish**.

**Figure 185. Map Network Drive window**


Map Network Drive
Map Network Drive
What network folder would you like to map?
Specify the drive letter for the connection and the folder that you want to connect to:
Drive:
G:
Folder:
\\DDSP052206\N4Share
Browse...
Example: \\server\share
Reconnect at logon
Connect using different credentials
Connect to a Web site that you can use to store your documents and pictures.
Finish
Cancel

8. Enter **SCXUser** as the **User name** and **viewcast** as the **Password**.
9. Click **OK**.
10. Click **Finish**. After a few moments, the network share will open.
11. Close the window. The mapped drive will now appear in My Computer under Network Drives.
12. Reboot the Niagara 4100.

# Appendix D: System menu

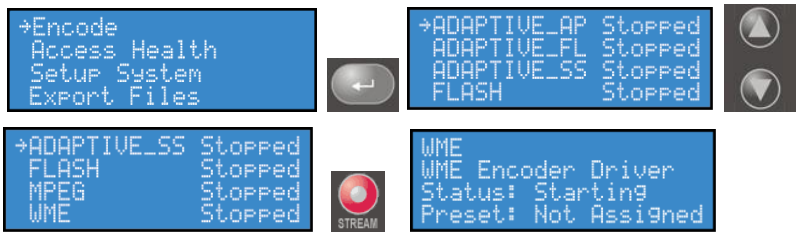
This section provides the detail of the *LCD menu tree*. It is intended to be a complete reference to all levels and functions accessible using the Niagara 4100 front panel LCD display.

It is designed to be a visual reference of the LCD screen including the front panel button action to move to the next screen.

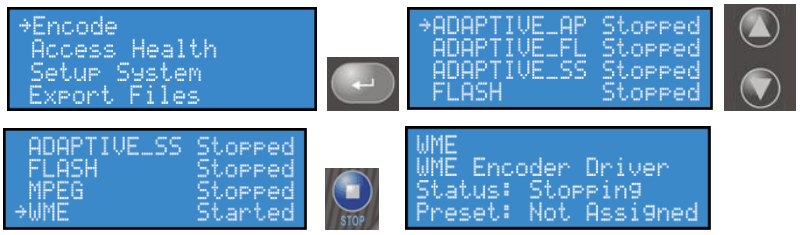
| Button | Action |
|---|---|
| | Power on |
| | Access Menu/Return to Previous |
| | Enter/Execute Command |
| | Mover Pointer Up/Down |
| | Start Encoder |
| | Stop Encoder |

# Encoder menu

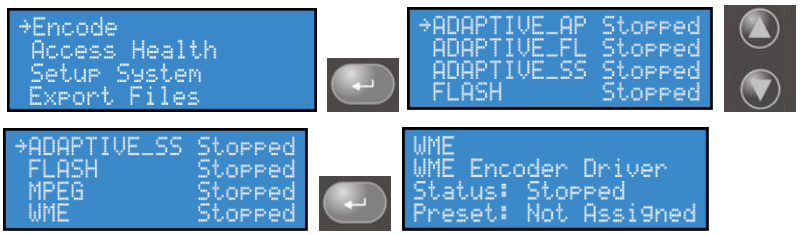
## Encoder start




## Encoder stop

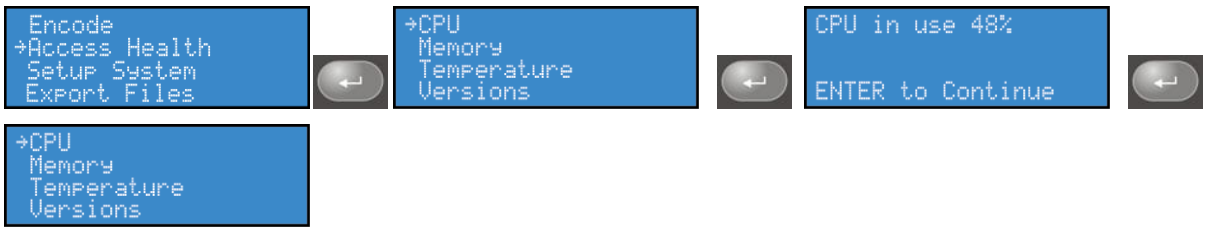



## Encoder status

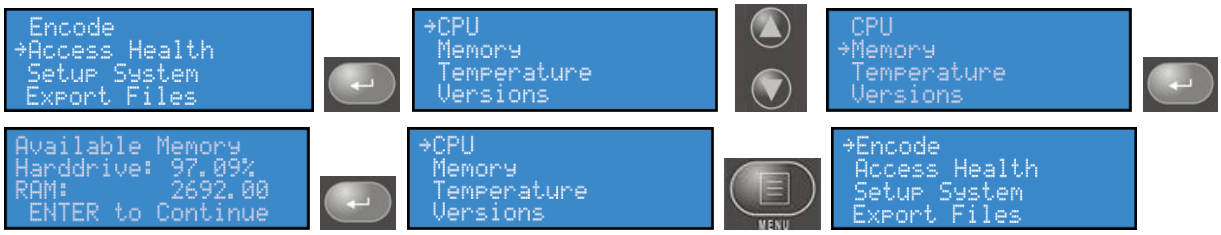


# Access Health menu

## CPU status

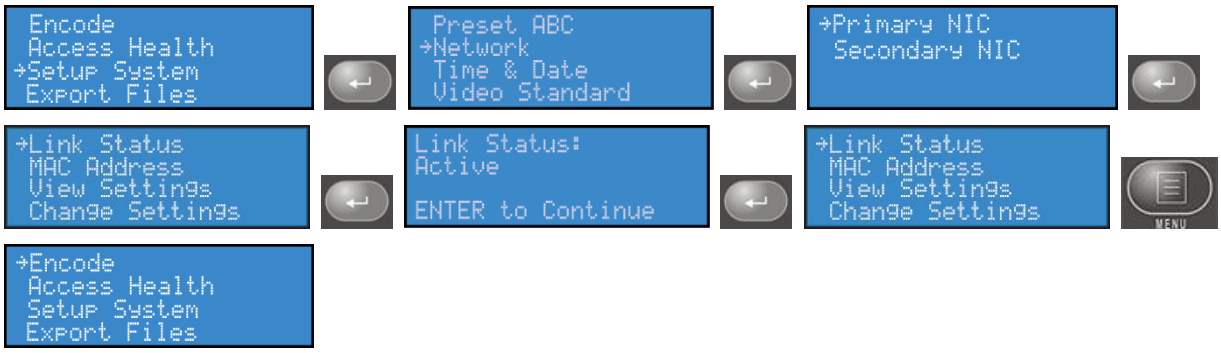



## Memory available



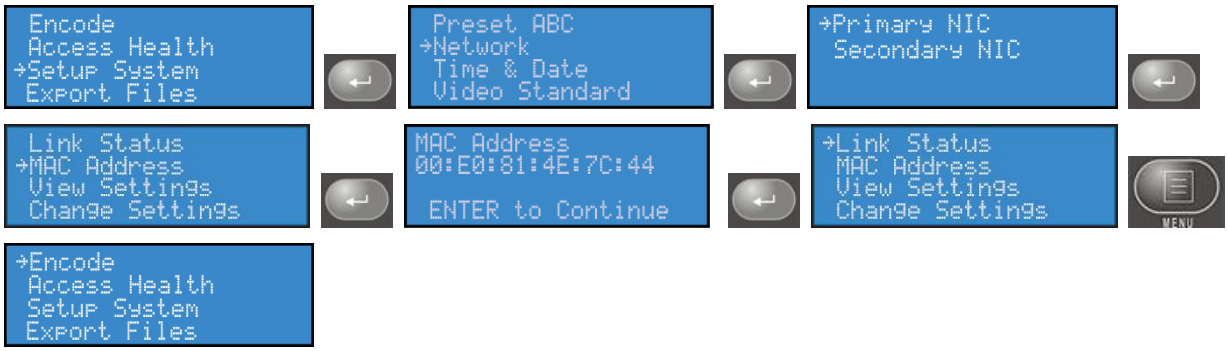
# Setup system menu

## Network link status



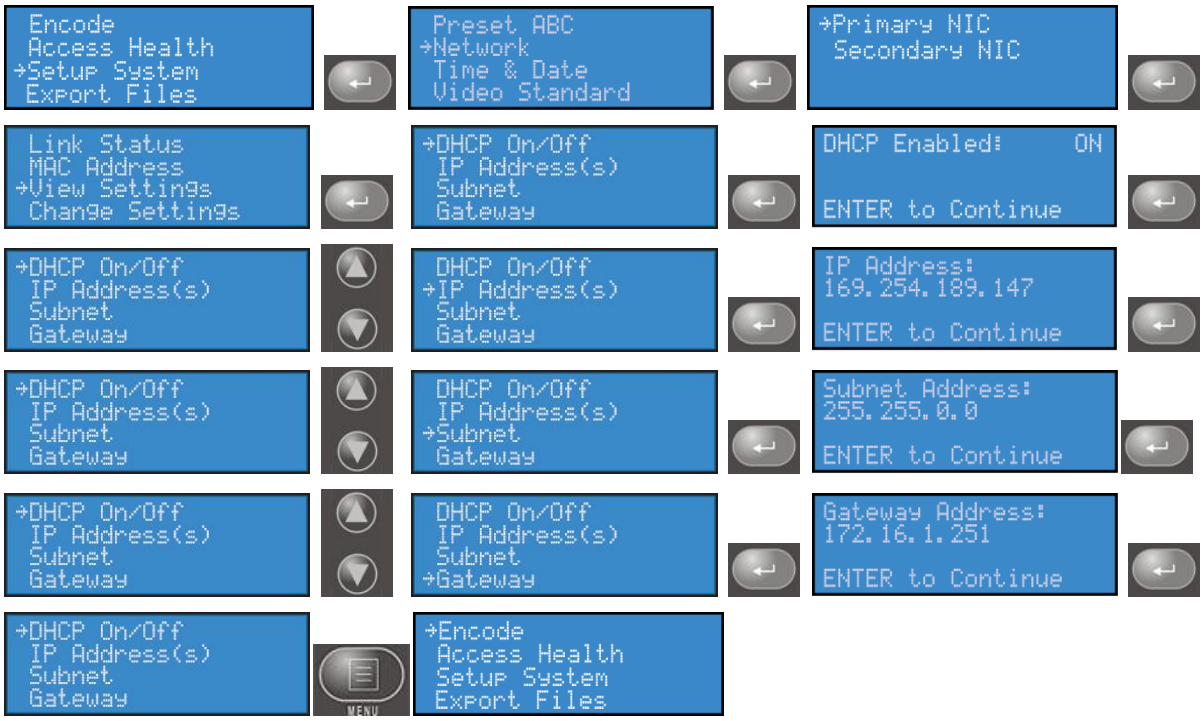

---

## Network MAC address

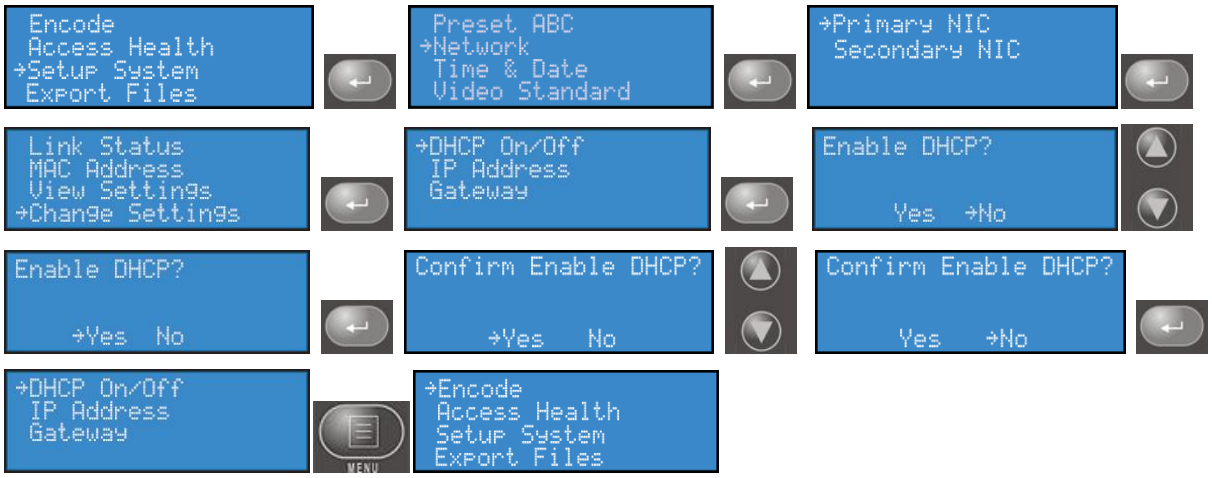



---

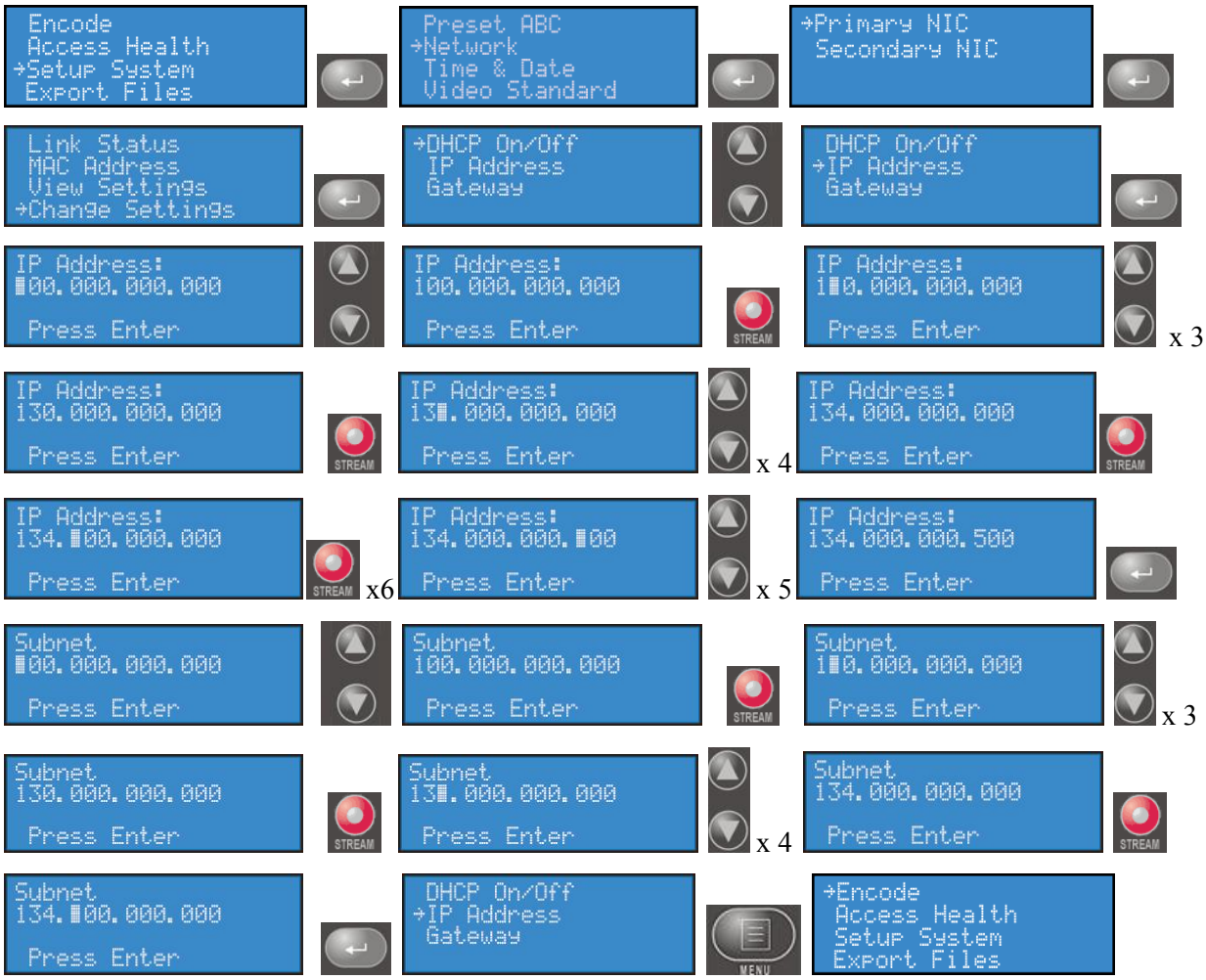
## View network settings




## Enable DHCP

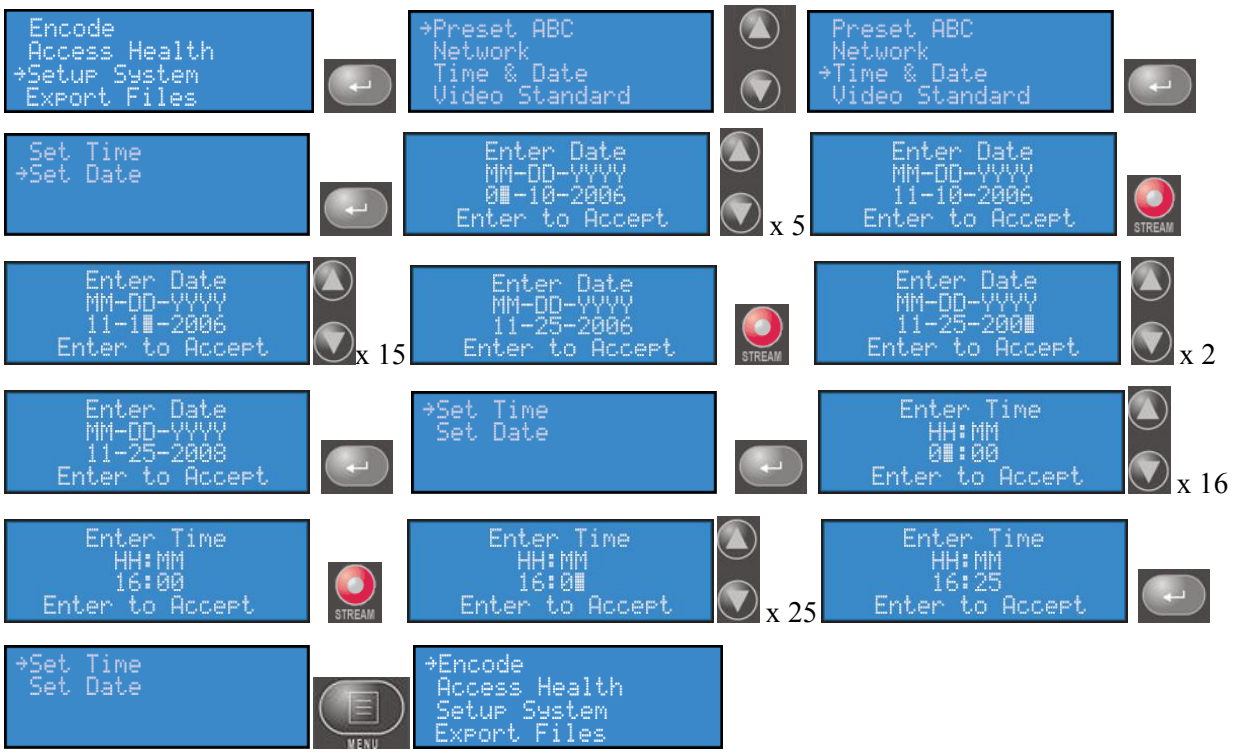


# Set static IP addresses



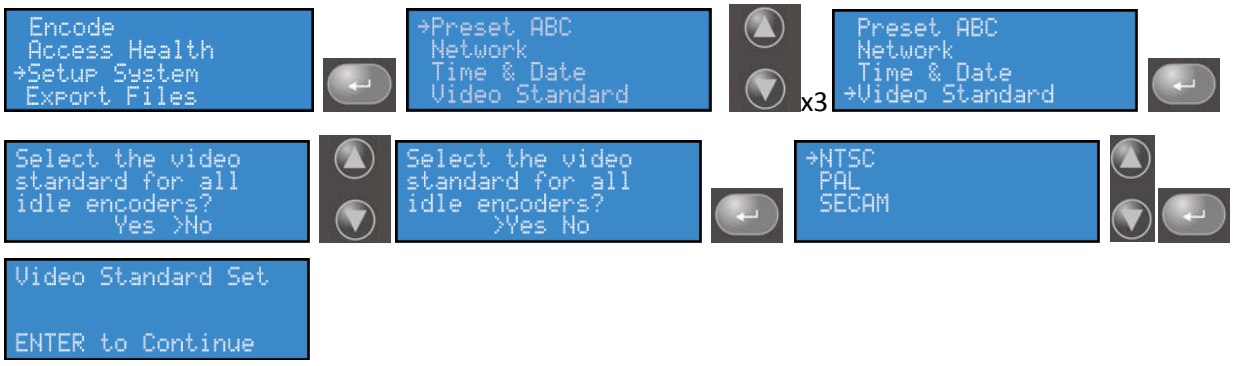
# Set gateway address

# Set date and time

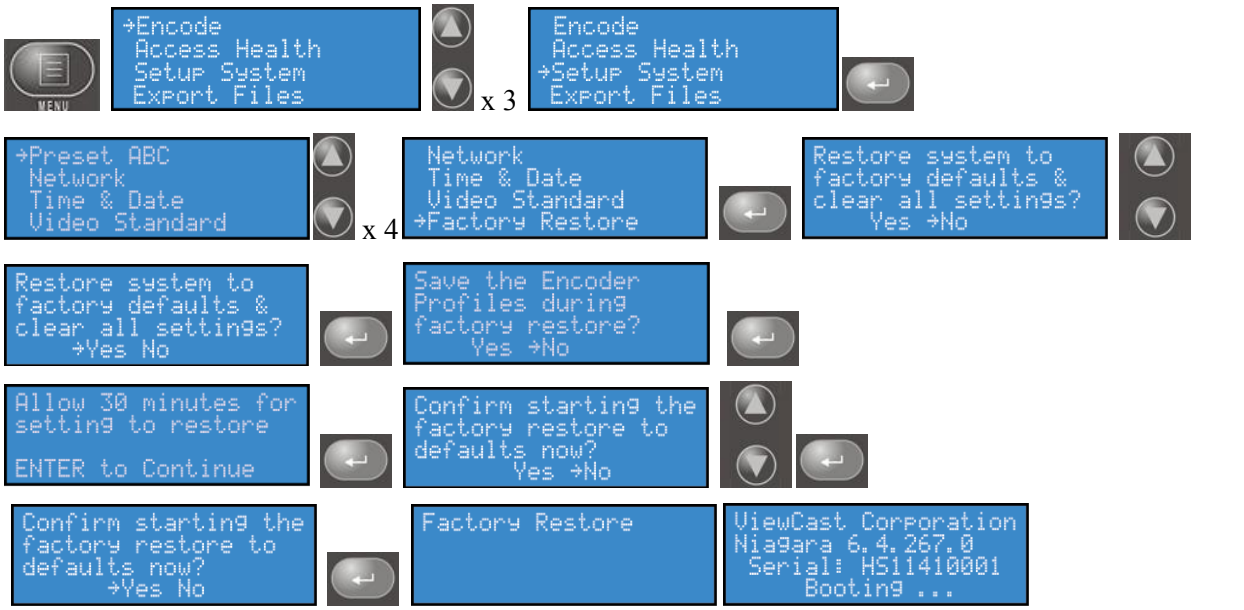



---

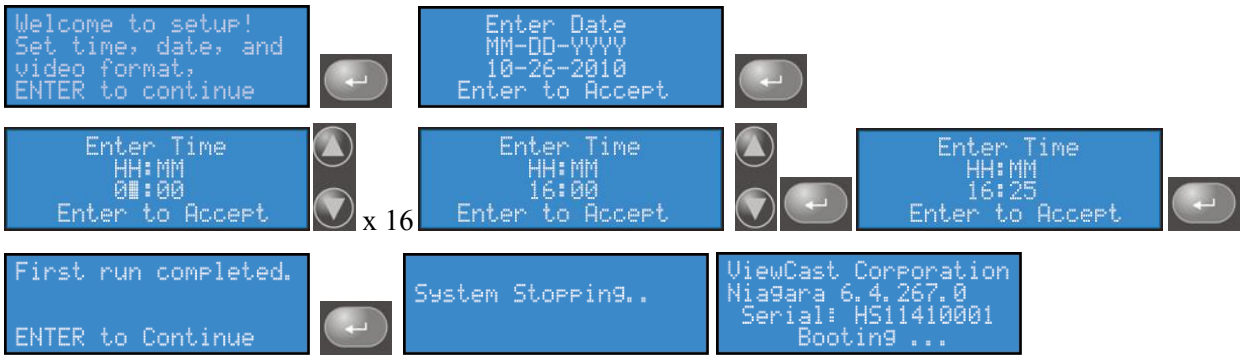
# Set video standard



# Factory restore

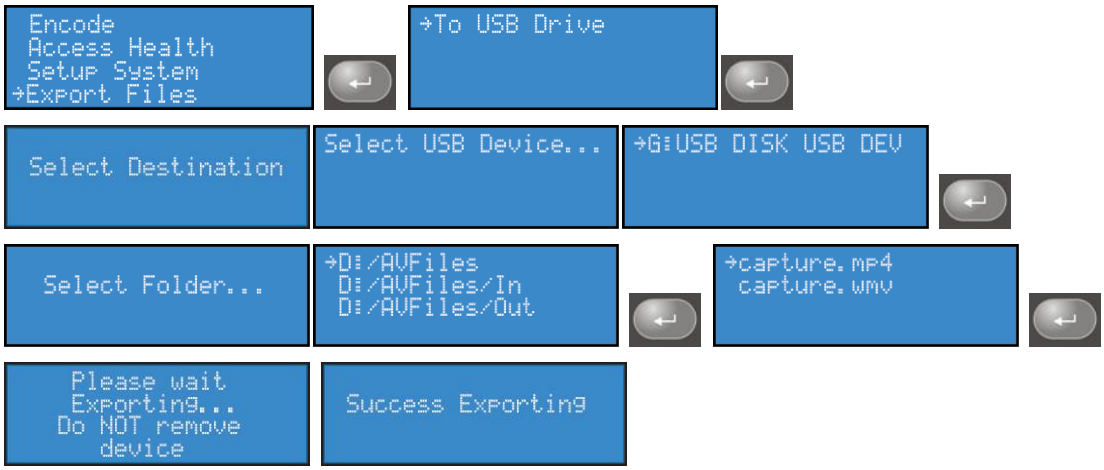



Note: This process actually takes ~10 minutes, be patient.

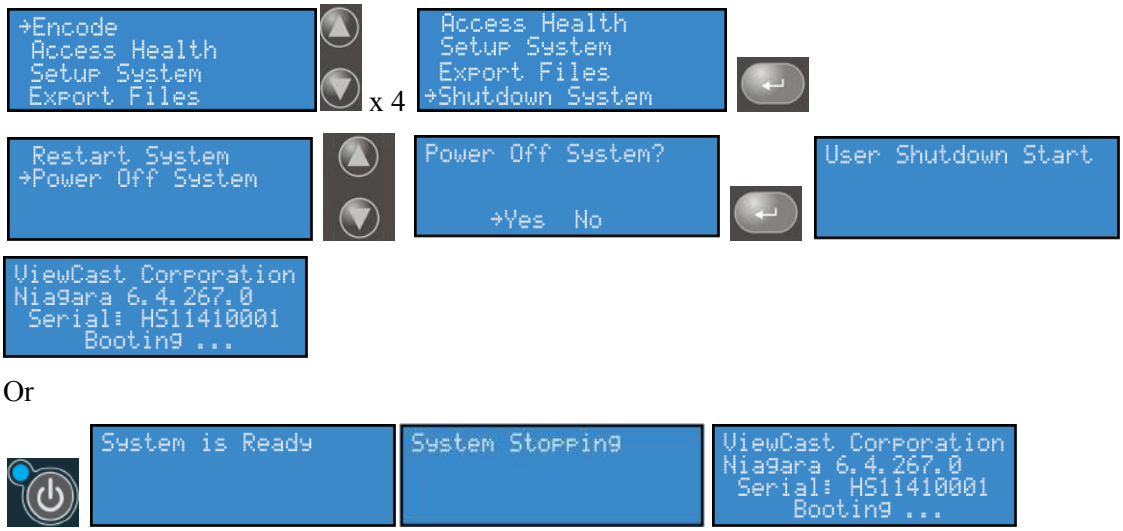


# Export files menu

## Export to USB drive




## Shutdown Niagara 4100




Or

# Index

A

Access menu, 31

Active Network Link field, 119

Activity Log window, 128

Adaptive Adobe Flash
  Video tab, 57

Adaptive Adobe Flash Encoder Properties, 56

Adaptive Apple
  Audio tab, 53, 62
  Output tab, 54
  video stream table, 51
    additional functions, 52
  Video tab, 49

Adaptive Apple HTTP Live Encoder Properties, 48

Adaptive Flash
  Output tab, 63
  video stream table, 60
    additional functions, 61

Adaptive Smooth Streaming
  Audio tab, 70
  Output tab, 71
  video stream table, 68
    additional functions, 69
  Video tab, 66

Adaptive Smooth Streaming Encoder Properties, 65

Added Users, 160

Admin Log In window, 35

Administrator Properties, 163

Administrators Properties window, 161

Advanced Settings, 118

advanced system settings, 35

Alerts window, 116, 129

Assign a static IP address, 23

Assign an encoders screen, 111

Assign Preset A button, 110

audience for publication, 1

B

Booting screen, 23

C

Change
  computer name, 114
  login password, 115
  the network settings, 23

Changing Computer Name, 114

Check CPU usage, 31

Computer Name field, 114

Configure
  Adaptive Adobe Flash
    video settings, 57
  Adaptive Apple
    audio settings, 53
    output settings, 54
    video settings, 49
  Adaptive Flash
    audio settings, 62
    output settings, 63
  Adaptive Smooth Streaming
    audio settings, 70
    output settings, 71
    video settings, 66
  email settings, 123
  Flash
    audio settings, 76
    H.264 settings, 79
    output settings, 77

## C (cont.)


video input settings, 74
idle screen information, 124
IP address, 118
MPEG-4
audio settings, 85
H.264 settings, 88
MPEG2 settings, 90
MPEG4 settings, 89
video settings, 81
SMTP (mail) settings, 123
TS container
Streaming, 102
Streaming to a TS container, 99
Windows Media
audio settings, 94
DRM settings, 98
output settings, 96
video settings, 92

Configure Advanced Network Settings, 118

Configure the Niagara 4100 Connections, 14

Configuring
MPEG-4
output settings, 86

Configuring community names, 133

Configuring permitted SNMP managers, 134

Configuring SNMP Agent contact and location, 138

Configuring trap destinations, 136

Confirmation screen, 23, 112

Connect
an external storage device, 33
the power source, 21

Connect to an IP network, 23

Connecting
the Niagara 4100, 14

Connecting an External Storage Device, 130

Connecting to an Electrical Power Source, 21

Conventions For This Guide, 2

CPU cycles screen, 31

CPU Threshold field, 126

Create
an encoder, 41
encoder groups, 106

Create New Encoder window, 41

Create new folder, 164

Current System Configuration, 122

Custom fields, 49, 57, 66, 74, 81, 92


## D


Date screen, 22

Default AV Folder field, 125

Default Directory Setting, 125

DefaultAVFolder field, 125

De-Interlace settings, 50, 58, 67, 82

De-Interlace Settings, 75, 93

Digital Rights Management, 143

Disclaimers, 2

Disconnect Remote Desktop, 147

Drive Destination screens, 33

DRM, 143
Open a remote desktop connection, 144

DRM Profile, 147

DRM Profiles, 146


## E


Easy first time set up, 21

easy setup, 19

Edit encoder groups, 108

Edit Encoder Groups, 106

Editing Encoder Groups, 108

Editing Preset Encoders, 112

Email Alert, 116

Email/SMTP Settings fields, 123

IEnable DHCP screen, 24

## E (cont.)

Encoder Groups window, 106
Encoder Groups window, 105
Encoder Groups Window, 108
Encoder Preset A window, 110
Encoder screen, 29, 32
Encoder Startup Settings, 126
Encoder Stopped, 44
Encoders window, 40, 43, 45
Encoding screen, 29
Environmental Notices, 5
Export captured video files, 33
Export Files function, 33
Exporting screens, 34

## F

FCC Notice, 4
File Sharing window, 166
Filename screen, 34
Flash
  Audio tab, 76
  H.264 Presets tab, 79
  Output tab, 77
  Video tab, 74
Flash Encoder Properties, 73
Folder name, 164
Folder Properties window, 165

## G

General tab, 145
Group screen, 111
Groups, 161

## H

H.264 Presets, 149

## I

Idle Screen Information, 124
Initializing messages, 27
Initializing messages, 22
Install Overview, 10
Interface screen, 23
IP address, 35
IP Address, 118
IP Route table, 120

## L

Local Resources tab, 145
Locations window, 161
Log in to web interface, 35

## M

Machine Properties window, 113
Map Network Drive window, 167, 168
Mapped network drive
  Map the network drive, 167
  Set up user accounts on a remote PC, 159
Mapped Network Drive
  Create
    the shared folder, 164
Media Appliance Functions, 9
Menu Bar Commands, 16
MPEG encoder and container descriptions, 83
MPEG2 Presets, 155
MPEG-4
  Audio tab, 85
  H.264 Settings tab, 88
  MPEG2 Settings tab, 90
  MPEG4 Settings tab, 89
  Output tab, 86
  Video tab, 81
MPEG4 Encoder Properties, 80
MPEG-4 Presets, 152

## N

Network Card options, 117
Network Card(s), 117
Network Card(s) field, 117
Network Cards, 117
Network Interface Cards, 23
Network Properties window, 117
Network settings screen, 24
New Session Wizard, 146
New User window, 160
Niagara 4100 back panel, 13
Niagara 4100 Back Panel, Review of, 13
Niagara 4100 browser window, 18
Niagara 4100 front panel, 12
Niagara 4100 Front Panel, Review of, 12
Niagara 4100 home page, 16
Niagara 4100 network name, 118
Niagara SCX Remote Management Software, 16
Niagara SCX User Guide, 130
No encoders screen, 111

## P

Package Contents, 10
Password Change window, 115
Perform
  the initial startup, 22
Performing the Initial Start Up, 22
Power off screen, 28
Prerequisites, 10
product description, 1
Product registration
  Contact Information, 38
  Product information, 38
Product Registration, 37
Properties Section, 115
Properties tab, 147

## Q

Querying system information, 140

## R

Rack Mount Safety Instructions, 3
Read/Write permissions, 166
Reboot message, 114
Register your system
  at viewcast.com, 37
  online, 37
Remote Desktop Connection, 144
Restore Factory Defaults window, 127
Restore Niagara 4100 Factory defaults, 126
Restore the Login Password to the Factory Default, 115

## S

Save to File Location, 78
Save to File setting, 33
Select a folder, 63, 71, 87, 97
Select Folder screen, 34
Select group screen, 111
Select source screen, 34
Select Users window, 162
serial number, 35
Set CPU Thresholds, 126
Set current system configuration, 122
Settings screen, 24
Setup menu, 23
Setup System Option, 23
Shutdown screen, 28
Shutdown screens, 28

## S (cont.)

Shutting down, 28

SNMP
- Agent tab, 138
- Community Name field, 133
- IP Addresses, 135
- Security tab, 133
- SNMP Service Configuration, 134, 136
- SNMP Service Properties – Security tab, 134
- Trap destinations, 137
- Traps tab, 136

Start
- an encoder from front panel, 29
- an encoder from the web interface, 42
- Niagara 4100, 27

Started icon, 44

Starting Encoder, 42

Starting screen, 29

Starting SNMP trap listener, 142

Starting Windows Media Encoder, 146

Starting/stopping all encoders in the system through SNMP, 142

Starting/stopping all encoders per group through SNMP, 141

Starting/stopping an encoder through SNMP, 141

Stop
- an encoder from front panel, 32
- an encoder from the web interface, 44

Stopped icon, 42

Stopping screen, 32

Subnet address screen, 24

System Configuration Settings window, 121

system menu, 15

System menu, 15, 28, 33

System Ready screen, 35

System Requirements, 11

System stopping messages, 28

## T

Time screen, 22

## U

USB Device screen, 33

USB memory device, 130

Use preset buttons to start encoding, 111

Use the Niagara SCX Interface, 130

Users, 159

Using UDP port other than 161 for SNMP requests, 139

## V

Valid output container selections for video encoder types, 84

Video Filter Settings, 50, 57, 66, 74, 82, 92

View Alerts, 129

View All Encoders, 112

View the list of encoder groups, 105

ViewCast Niagara 4100, Picture of, 1

## W

Warnings, 7

Warranties, 2

web interface, 20

Welcome window, 36

Windows Media
- Audio tab, 94
- DRM tab, 98
- Output tab, 96
- Video tab, 92

Windows Media encoder properties, 91

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